Mini Hi-Fi System

FWT9200/ all

Service
Service
Service

Service Manual

PureDigital Bluetooth AUDIO IN MP3-CD PLAYBACK MP3 RIP PLUS USB DIRECT MAX SOUND 650W RMS Total Power KARAOKE

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CLASS 1
LASER PRODUCT

Published by LX 1317 Service Audio Printed in The Netherlands Subject to modification

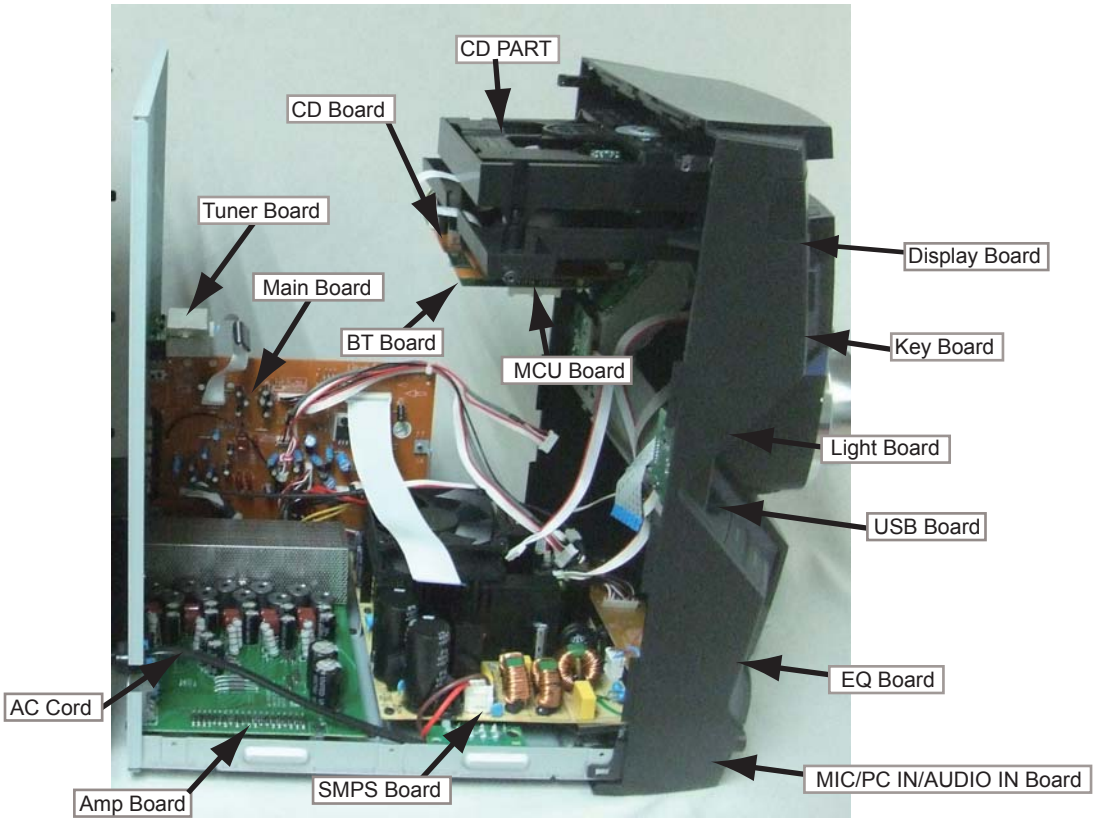
3140 038 60210

Version 1.0

PHILIPS

Technical Specification and Connection Facilities

Location of PC Boards



VERSION VARIATION

Type /Versions: / Service policy / Board in used:	FWM9200									
	/55 (LATAM)	x/77 (ARGENTINA)	x/78 (BRAZIL)							
Main BOARD	C/M	C/M	C/M							
Display BOARD	C/M	C/M	C/M							
Amp BOARD	C/M	C/M	C/M							
Key BOARD	C/M	C/M	C/M							
Mic BOARD	C/M	C/M	C/M							
Tuner BOARD	C/M	C/M	C/M							
SMPS BOARD	M	M	M							
CD BOARD	C/M	C/M	C/M							
MCU BOARD	C/M	C/M	C/M							
Type /Versions: / Features / Feature diffrence	FWM9200									
	/55	x/77	x/78							
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK										

* TIPS : C -- Component Lever Repair.
M -- Module Lever Repair
√ -- Used

C/M
C/M

FWT9200 SH 190 content List

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Issue: Andy Lai
Checked:

DATE: 2012-12-21

DEPICTION	Pos	Description	Page
			

I.TUNING
UNING

CABINET

Diemensions with Boxes (wxhxd) 265mm X 382mm X 345mm	Material : HIPS / ABS / POM / V2 / SAN	
Diemensions without Boxes (wxhxd) 1250mm X 340mm X 495	Finshing : Chrome Plate	
Weight (inclusive packing)8.505KG	Units in Masstercarton	
Weight (exclusive packing & batery)26KG	Units in Dealercarton	

Remarks :

1	used into		

Remark :

GENERAL PART 1 - FRONT PANNEL SPECICFICATION

Class No			Ver	Issued Date
		FWT9200 All Version	1	21-Dec-12
			2	
			3	

NAME :		11	11	SH 190 - 1			A4
	CHECK:	DATE :					

DEPICTION	Pos	Description	Page

GENERAL PART 1 - BACK PANNEL SPECICFICATION

Class No		Ver	Issued Date
	FWT9200 All Version	1	
		2	
		3	

NAME :	10	10	SH 190 - 2		A4
	CHECK:	DATE :			

GENERAL DESCRIPTION
MP3-USB Mini Hi FiSystem with Digital Tuner, 3CD/MP3
(2x360W+2x360W+2x180W) For FWT9200 Power Amplifier,VFD Display,Aux in ,Remote control
Subwoofer Boxes of 8 Ohm x 2

LIFETIME : 7 Years

Class	Tuner	Supply + Amplifier	USB	Recorder	Clock	CD-mp3
I						
II	X	X	X	X	X	X
III						
Page	10	3-6	9		8	11

SAFETY requirements

Version	Safety	EMC
/98	EN 60065,	CISPR 13
/55	EN 60065,EN61000-3-2/EN61000-3-3	CISPR 13
/12	EN 60065	EN 55013 / EN 55020
/05	EN 60065	EN 55013 / EN 55020
/79	EN 60065	CISPR 13
/37	UL 60065	FCC99

RADIATION / IMMUNITY requirments (EMC) for 12 version only

CLIMATIC requirements
ALL climates : + 5 Dregree till + 35 Degree
MODERATE climates : + N.A till N.A Degree

PERFORMANCE CLASSES

POWER SUPPLY (**SWITCHING MODE POWER SUPPLY)**

MAINS (A.C.)	SWITCH POWER FOR AC100V TO 250V				
Version					
Voltage Selection					
Frequency					

POWER CONSUMPTION				
	/ 12/ 05	/ 55/77/78/98	/61 /93	/ 37
Standby(with display) :	< 1W	Ref. to CRS	Ref. to CRS	< 1W
(DEMO mode " OFF ") , NOM. A, INPUT				
Maximum :				
@ 1/8 Prated , NOM. A, INPUT	< 250W			
ECO Power mode(Without display):	< 0.5W	Ref. to CRS	Ref. to CRS	< 0.5W

Quality : 0.8 % (Major) 2.0 % (Mirror)
Reliability : 3.0 % (C 42)
Tested according to General Test Instruction refer to PHILIPS standary (UAN -D1591)
Measured according to PHILIPS standary (UAN - L1059) unless other wise stated
All not mentioned date, please refer to PHILIPS standary (XUW - 0010 - JUNE 2001)

DERIVED	REMARKS	APPROBATION

Remarks

GENERAL PART 1 - GENERAL SPECICFICATION

Class No			Ver	Issued Date
		FWT9200 All Version	1	21-Dec-12
			2	
			3	

NAME : Andy Lai			10	10	SH 190 - 3			A4
			CHECK	DATE :				

TECHNIAL DESCRIPTION

Total power 1800W, matching LOUDSPEAKER of 4 x 8 Ohm +2 x 4 Ohm. INPUT SOURCE, CD/MP TUNER USB AUX 3DSC (Digital Sound Control). IS (Incredible Sound)

GENERAL PART

OUTPUT stage Protection : Yes Temperature : Yes. Shorcircuit : Yes

LoudSpeaker D.C. Protection : Yes.

INDICATORS

Standby Mode Indicator : FTD display Clock active

ECO Mode Indiicator : FTD turns off, ECO - Standby LED turn on

ELECTRICAL DATA (Main computer)

DSC :	Rock, Pop, Jazz, Optimal	Channel Differencer at -40dB	3	dB
MAX	YES	Hum (Volume control from min. till max. – 20 dB)	< 200	nW
IS :	YES	Residual Noise (Volume Minium)	< 60	nW
VAC :	N/A	Channel Separation (at 1 kHz)	⩾ 45	dB
WOOX :	N/A	Signal / Noise (unweighted)	⩾ 55	dB
		Subwoofer Out Hum(Volume minmun)	<4	μW

INTERCONNECTS

Input Sensitity(±2 dB)rated ouput power at 1 kHz and 10kHz. Line Output Voltage (*1)

Tuner	:	FM 67.5KHZ AM80% Modulation	Line Out (Left / Right)		N.A
CD	:	0 dB track (Audio Disc 1, Trk 35)	Subwoofer Out		Yes
USB	:	0 dB track (Audio Disc 1, Trk 35)	Headphone		0.7V +/- 0.2% at 32 Ohm
AUX	:	Nor: 600mV Lim: 350mV ~ 900mV for /37	Digital Coaxial Out		N.A
	:	Nor: 2V Lim: 1.5V ~ 2.5V for /55	Booster Out		N.A
Microphone	:	input leven 1mv rms(lim:2.5mv rms) Rs=600ohm	Frequency response @±4dB	Main Channnel	40HZ-16KHZ(reference 1KHZ)
				SUB. Channel	40HZ-125HZ(reference 63HZ)
				Rear channel	200HZ-16KHZ(reference 1KHZ)

output power 1kHz

OUTPUT POWER (* 1)At THD = 10% (Measured with 20Hz-20KHz filter),(Per Channel measuremend)

Power output (RMS)		L/R channel	360W (Lim '-1dB)
Power output (RMS)			
Power output (RMS)		L/R Subwoofer channel	360W (Lim '-1dB)
Power output (RMS)		L/R Rear channel	180W (Lim '-1dB)
Tuner output (Lim '-6dB)			

LOUDSPEAKER (BOXES) Please to package document of Speaker Box Assy

Rated Impedance

FRONT:L/R : 8 Ohms X2 at 40Hz to 16 KHz

Subwoofer L/R : 8 Ohm x2 at 40HZ to 100HZ

Rear: L/R : 4 Ohms X2 at 200Hz to 16 KHz

Remarks

(*1) Measurement output power just connect 1 channel loads (Per channel measurement).
Electrical parameters are to be measuremend at specker terminals across 8 Ohm load (pure resistor)
with rated input signal in AUX mode; DSC setting in Jazz mode with DBB OFF
IS off and OSM unless specified otherwise
Measurement output power only for AUX model and CD model of used audio analyzer equipment.

(*2) All speaker "R" channel "+ "connect to equipment " + "for measurement.
All speaker "L" channel "- "connect to equipment " + "for measurement (because all "L"channel output are reverse).

GENERAL PART 1 - TECHNAICAL SPECICFICATION

Class No		Ver	Issued Date
	FWT9200 All Version	1	21-Dec-12
		2	
		3	

NAME : Andy Lai		10	10	SH 190 - 4			A4
		CHECK	DATE :				

AUDIO SIGNAL PROCESSING

MP3-USB Mini Hi Fi System with Digital Tuner , 3 CDC-MP3,(Main:2×3+60W+Rear:2×180W+SUB:2x360W) Universal Class D Power Amplifier

1) DSC (Digital Sound Control)

Select AUX as input source with the following set conditions:
Inject sine wave 500mV at 1 KHz to L/R channels of AUX-IN socket.
Set DSC to JAZZ(Flat) mode and switch off DBB.
Refence level for DSC's without DBB on=1W.
Refence level for DSC'S with DBB on=1.2V at the speaker terminal .
Inject sine wave 500mV-2.4V to AUX-IN socket with frequencies indicated in Table 1.
For FWM998 Subwoofer in put 500mW 60HZ @ 3R (Main computer)

Tabel 1a (Tolerance ± 3dB)

Frequency	DSC Modes with DBB Off			
	JAZZ	POP	TECHNO	OPTIMAL
60 Hz (SUB)	0	4	6	2
1K((SUB)	0	0	0	0
1 kHz (host computer)	0	0	0	0
10 kHz(host computer)	0	2	-4	2

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 1 ON			
	JAZZ	POP	TECHNO	OPTIMAL
60 Hz (SUB)	4	8	8	6
1khz(SUB)	0	0	0	0
1 kHz (host computer)	0	0	0	0
10 kHz (host computer)	0	2	-4	2

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 2 ON			
	JAZZ	POP	TECHNO	OPTIMAL
60 Hz (SUB)	10	16	16	13
1 kHz(SUB)	0	0	0	0
1khz (host computer)	0	0	0	0
10 kHz (host computer)	0	4	-2	2

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 3 ON			
	JAZZ	POP	TECHNO	OPTIMAL
60 Hz (SUB)	16	20	20	20
1khz(SUB)	0	0	0	0
1 kHz(host computer)	0	0	0	0
10 kHz(host computer)	2	6	0	4

2) DBB (Dynamic Bass Boot)

Select AUX as input source with the following set conditions :
Inject sine wave 500mV at 1kHz to L/R channels of AUX - IN socket.
Set DSC to JAZZ(Flat) mode and switch off DBB,
Reference level for the test is 500mW on the speaker terminals.
Tabel 2 of FWM998(Tolerance ± 3dB)

Frequency	DBB OFF	DBB 1	DBB 2	DBB 3
60 Hz(SUB)	0	4	8	12
1 Hz(SUB)	0	0	0	0
1khz(host computer)	0	0	0	0
10K Hz(host computer)	0	0	0	2

AUDIO SIGNAL PROCESSING

MP3 - USB Mini Hi Fi System with Digital Tuner , 3 CDC-MP3, (Main:2×360W+SUB:2×360W+Rear:2x180W) Universal Class D Power Amplifier

3) IS (Incredible Sound)

Select AUX as input source.
Inject sine wave 2V at 1kHz to AUX-IN socket, two channel at a time (input level 600mV for /37,2V for /55).
Set DSC to JAZZ (Flat) mode and switch of DBB, OSM & INCREDIBLE SURROUND.
Adjust volume level to obtain 1W across 3 OHM load at L/R speaker output.
Inject sine wave 2V to AUX-IN socket withfrequency indicated in Table 3 (input level 600mV for /37,2V for /55).

Table 3 (Tolerence ± 3 dB)

FREQ	INPUT LEVEL		OUTPUT LEVEL			
			IS OFF		IS ON	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
60 Hz	2V	-	- 1.0 dB	-	+2.0 dB	- 15 dB
1 kHz	2V	-	0	-	+ 3.5 dB	0 dB
10 kHz	2V	-	- 0.5 dB	-	+ 3.0 dB	-5 dB

Note : The above specs also apply to right channel.

4) DSC Mode (Jazz , Rock, Techno and Optimal)

The VEC modes are software controlled by switching the combination between DBB and DSC modes
as show in Table 4.

VEC MODE	DBB Level preset
Jazz	DBB OFF
POP	DBB 3
Techno	DBB 3
Optimal	DBB 2

Note : When these modes are activ DBB and DSC will not be displayed

5) MAX (Maximum Sound)

Select AUX as input source.
Inject sine wave 2V at 1kHz to AUX-IN socket, one channel at a time (input level 600mV for /37,2V for /55).
Set DSC to JAZZ (Flat) mode and switch of DBB, OSM & INCREDIBLE SURROUND.
Adjust volume level to obtain 1W across 3 OHM load at L/R speaker output.
The 1W level will be used as 0 dB reference
Inject sine wave 2V to AUX-IN socket withfrequency indicated in Table 5 (input level 600mV for /37,2V for /55).

FREQ	Max OFF	Max ON		
60 Hz	-1	+19		
1 kHz	0	+5		
10 kHz	-1	+7		

TECHNIAL DESCRIPTION

SOFTWARE IMPLEMENTED CLOCK / TIMER FUNCTION WITH 12MHZ QUARTZ OSCILLATOR.

GENERAL PART

Timer Setting	:	Clock and Timer
Timer Wakeup Mode	:	CD or Tuner or USB
Remarks Time Setting	:	12hr for /37 version, 24hrs for other version.
Volume at Wakeup	:	Last Setting
No of Timer Settings	:	1
Clock Accuracy	:	Nom : 1 sec/day Limit : 2 sec/day

INDICATORS

Display Type	:	VFD

Remark

CLOCK / TIMMER SPECICFICATION

Class No		Ver	Issued Date
FWT9200 All Version		1	2012-21-21
		2	
		3	

NAME : Andy Lai	10	10	SH 190 - 7			A4
CHECK	DATE :					

TECHNIAL DESCRIPTION

USB

See also SH 190 USB Audio Module (300605)
Measurment are directly done at the coonector on the board
GENERAL PART

Measurement are directly done at the connector on CDC board

Description	Specification
Output Resistance	< = 1.5 kOhm
Output Voltage RL = 33 k ohm ( )dB, 1 Khz)	830mV/- 1dB
Channel Unbalance	< = +/- 3 dB
THD + Noise (0dB, 1Khz)	<=2%
Channel Crosstalk ((0 dB, 1 KHz))	>= 45dB
(0 dB, 1 KHz)	>= 45dB
Signal to Noise Ratio (0dB,1kHz) (A - weighted)	>= 55dB(A - weighted)
FWT9200 Frequency response @±4	40HZ-16KHZ(reference 1KHZ)
	40HZ-100HZ(Reference 63HZ)
	200HZ-16KHZ(Reference 1KHZ)

USB Measurement at Set Level (*2)

Electrical Parameters are to be measured at speaker teminals across 3 ohm load with 500mW output and DSC setting in Jazz Mode

Description	Specification
Channel Crosstalk (0 dB, 1 KHz)	>= 45dB (with 1 KHz filter)
Signal to Noise Ratio (0 dB, 1 KHz)	>= 55dBA (A - weighted)
Channel Unbalance (0 dB, 1 KHz)	< +/- 3dB

SD-CARD Measurement at Set Level (*2)

Electrical Parameters are to be measured at speaker teminals across 3 ohm load with 500mW output and DSC setting in Jazz Mode

Description	Specification
Channel Crosstalk (0 dB, 1 KHz)	>=45dB (with 1 KHz filter)
Signal to Noise Ratio (0 dB, 1 KHz)	>= 55dBA (A - weighted)
Channel Unbalance (0 dB, 1 KHz)	< +/- 3dB

Remarks :

(*2) All speaker "R" channel "+"connect to equipment "+"for measurement.

All speaker "L" channel "- "connect to equipment " + "for measurement (because all "L"channel output are reverse).

USB AND SD-CARD SPECICFICATION

Class No				Ver	Issued Date
		FWT9200 All Version		1	21-Dec-12
				2	
				3	

NAME : Andy Lai			10	10	SH 190 -8			A4
			CHECK	DATE :				

TECHNIAL DESCRIPTION

TUNER used SI4730 soultion

GENERAL PART

WAVE RANGE	TOLERANCE	TUNING GRID
FM(55/37) 87.5 - 108.00 MHz	QUARTZ PRECISION	100 kHz
FM(12) 87.5 - 108.00 MHz		50KHZ
AM (55/37) 530 - 1700 kHz	QUARTZ PRECISION	10 kHz
AM (12) 531 - 1602 kHz	QUARTZ PRECISION	9 kHz

AERIAL

FM : PIGTAIL ANT WIRE 300 Ohm(for/37) 75ohm for 55/12

AM : FRAME ANT. 18.1 uH with shielding

INDICATORS

VFD

A.M	Nom	Limit	Unit	F.M.	Nom	Limit	Unit
				- 3 dB Limiting Point	: 17	23.5	dBf
Amplification Reverse	: - 2	-4	dB	Amplification Reverse	: 0	-4	dB
AGC Figure of Merit	: 30	25	dB	Distortion (RF 1mV, Frq Dev.75 kHz)	: 2	3	%
Distortion (RF 50mV, M 80%)	: 3	5	%	Stereo - 46 dB Quieting	: 46	49	dBf
IF	: 450	± 3	kHz	Crosstalk (RF1mV, Freq Dev.40kHz)	: 25	18	dB
				IF	: 10.7	± 0.03	MHz
Search Tuning Sensitivity	: α26	+/-10	dB		24-30	19-35	dBf
S/N Ratio	45	40	dB		50	45	dB

Wave Range		Noise Limited Sensitivity α26 dB			Image Rejection	IF Rejection	Large Signal	Selectivity S9 / 300kHz
MW 610 kHz	Nom.	3500		uV/m	32 db	28db	1000mv/m	22db
	Lim.	4000		Uv/m	28db	24db	500mv/m	18db
MW 1440 kHz	Nom.	1500		uV/m	32db	28db	1000mv/m	22db
	Lim.	4000		uV/m	28db	24db	500mv/m	18db
FM 98 MHz	Nom.	18		dBf	40db	65db	116 dBu	30db
	Lim.	22		dBf	30db	60db	108 dBu	25db
FM 108 MHz	Nom.	18		dBf	40db	65db	116 dBu	45db
	Lim.	22		dBf	30db	60db	108 dBu	25db

Remarks：MAX.Sens -6dB

TUNER SPECICFICATION

Class No		Ver	Issued Date
	FWT9200 All Version	1	21-Dec-12
		2	
		3	

NAME : Andy Lai	10	10	SH 190 - 9			A4
		CHECK	DATE :			

TECHNIAL DESCRIPTION

CD + MP3 - Part Specifications (CD MECHAISM DA11VF OF SANYO)

	Input	Output	Motor	Logic control
Active components				
	Signal processsing	D/A converter	HF-preamplifier	Servo processor
Active components				

AUDIO part: Measurement with Audio Signals Disc-783 7104 078 04911 on spkeakers or Headphone socket with nom.load

Description		Extern Filter	Nom	Lim	Unit
De-emphasis		15us / 50us Switchable via Subcode information			
Frequency accuracy			N/A	± 0.5	%
Channel Unbalance			1	3	dB
Frequency Response (40 Hz - 16 kHz) reference 1kHz	FRONT CH. Rear CH.) SUB. CH.	L/R		'± 4	dB
requency Response (200Hz - 16 kHz)reference 1kHz		L/R		± 4	dB
Frequency Response (40Hz - 100Hz) reference 63Hz		L/R			dB
Signal to Noise Ration (Unweighted)			60	50	dBA
Signal to Noise Ration (A - weighted)			65	55	dBA
Crosstalk (1kHz) (A - weighted)			>= 45dB		dB
					dB
Hum & Noise (filer 20kHz) (*1)			1	1.5	mV
THD (1KHz -6dB)			0.2	<1	%
THD (10KHz -20dB)			<1	<3	%

REMARKS:

1. Amplification reserve for CD = +2dB ('±2dB),Ref.Level for CD is a 0dB track instead of a .-6dB track.

Playability :(acc.To AR 30-05-239)

	Limit	Typical	Test disc
Wedge	600um	900um	TNO 7, 9 of SBC 444A(7104 099 24990)
Eccentric	150um	200um	TNO 1, 24 of 200um disc (7104 099 24960)
Fingerprint	No audible defect		TNO 11 of Sub chassis 8A
Black dot	500um	800um	TNO 13 of SBC 444A (7104 099 24990)
Skew 0.6mm	No audible defect		TNO 1,6 of 0.6mm skew (7104 099 28260)
Bad HF track	No audible defect		TNO 8 of Sub chassis 8A
Hwavy fingerprint	No track jumper/plops		TNO 10 of Sub chassis 8A
Playback position	Solid, Normal position (Set is located on a flat surface, floor)		

1. Playback of above mentioned tracks possible wihout track loss or audible defects.
2. Double black dot, max. diameter, thin/disk is according to PQR or AR 30-05-239
3. This unit can playback (only) CD-R or CD-RW discs. For performance specification, Please refer to module. specification of CD99 (3103 308 52190)

Remarks :

4. (1)All speaker "R" channel "+ "connect to equipment " + "for measurement.
   (2) All speaker "L" channel "- "connect to equipment " + "for measurement (because all "L"channel output are reverse).

CD / MP3 SPECICFICATION

Class No		Ver	Issued Date
	FWT9200 All Version	1	21-Dec-12
		2	
		3	

NAME : Andy Lai	10	10	SH 190 -10			A4
	CHECK	DATE :				

TECHNIAL DESCRIPTION

Bluetooth Function

GENERAL PART

Bluetooth Version :	Ver2.1 + EDR		
Receive A2DP:	N/A		
Transmit A2DP:	N/A	Remote Controlled :	N/A
Receive HSP	N/A	Noise Reduction System :	No

INDICATORS

Bluetooth Flashing	:	Yes
Display	:	N/A

ELECTRICAL DATA

Bluetooth at Module level:		Mobile Phone	lim	Unit
Frequency Response		125-16khz	± 7	dB
S/N (Unweighted)		≥55	50	dB
S/N (A-weighted)		≥60	55	dBA
Level Diff		\	± 3	dB
Channel Separation		≥45	40	dB
Distortion		＜1		%
Bluetooth at Set Level		Mobile Phone		
10%THD OUTPUT POWER(EQ:FLAT)		\	Per channel test total:1800	W
Connected distance		8~10		meter

REMARKS

Bluetooth SPECICFICATION

Class No		Ver	Issued Date
	FWT9200 All Version	1	21-Dec-12
		2	
		3	

NAME : Andy Lai	DATE :	SH 190 - 11
CHECK:	DATE :	

TECHNIAL DESCRIPTION

Microphone

See also SH 190 testing with 20 to 20k Hz filter,input leven 1mv rms(lim:1.5mv rms) Rs=600ohm output 500mW
Measurment are directly done at the coonector on the board

GENERAL PART

Measurement are directly done at the connector Microphone(mic1,mic2)

Description			Specification			
			Nom	Lim	Unit	
Output Resistance			N/A			
Output Voltage RL = 33 k ohm ( )dB, 1 Khz)			N/A			
Channel Unbalanceo about(mic1 and mic2)			1	+/- 3	dBA	
THD + Noise (0dB, 1Khz)vol max			6	8	%	
Channel Crosstalk ((0 dB, 63Hz))			N/A			
(0 dB, 1 KHz)			N/A			
Signal to Noise Ratio (0dB,1kHz) (A - weighted)			45	40	dBA	
Microphone Power output(RMS)			550	+/- 20%	mW	
Microphone input leven (Rms)			1	1.5	mV	
Max Hum Noise(mic vol max,main vol max)			6	8	mV	
Vol.min=vol1.(mic vol min,main vol 1)			2	4	mV	
Microphone Frequency response at volume 23,input leven 1mv rms, connect main load	FL/FR ch	63HZ	-12	±4	dB	
		1KHZ	0	ref	dB	
		10KHZ	-3	±3	dB	

Remarks :

testing with 20 to 20k Hz filter

USB SPECICFICATION

Class No				Ver	Issued Date
		FWT9200 All Version		1	21-Dec-12
				2	
				3	

NAME : Andy Lai			12	9	SH 190 -9			A4
			CHECK	DATE :				

VERSION OVERVIEW FWT9200

Ver	DEST	APPROBATION		TUNER				AC SUPPLY			MIC MIX	MAT RIX SURR . SPK.
		SAFETY	EMC	Wave RANGE	GRID	AERIAL SOCKET	AERIAL SUPPLIED	MAINS VOLTAGE	SOC.	CORD		
/55 /77/78/98	OVS	EN60065 CLASS II SISR TAIWAN	CISPR 13	FM 87.5-108MHz MW 531-1602kHz or 530-1710kHz	50kHz 9kHz 10kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	110-127V Switched 220 - 240V 50/60Hz	IEC	IEC	No	No
/05 / 12	EUROPE	EN60065 SEMKO DEMKO NEMKO SEV BS415-UK	EN55013 EN55020	FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	230V 50Hz	IEC	IEC	No	No
/79	AUST / NZ	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	240V 50Hz	IEC	IEC	No	No
/37	USA Canada	UL 6500	FCC 99	FM 87.5-108MHz MW 530-1710kHz	100kHz 10kHz	JALCO Click Fit JST XH 2P Side	300 Ohm Dipole Loop Sagami 18.1uH	120V 60Hz	UL	UL	No	No
/35	China	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	220V 60Hz	IEC	IEC	No	No
/ 33	Korea	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	220V 60Hz	IEC	IEC	No	No

Remark :

1. AM default is 10K; in AM mode tight press "STOP" button can change to 9K.

VERSION OVERVIEW

Class No		FWT9200 All Version		Ver	Issued Date
				1	21-Dec-12
				2	
				3	

NAME : Andy Lai		10	10	SH 190 - 13			A4
	CHECK	DATE :					

2.0 SAFTETY INSTRUCTIONS

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

Caution: These servicing instructions are for use by qualified service personnel only.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

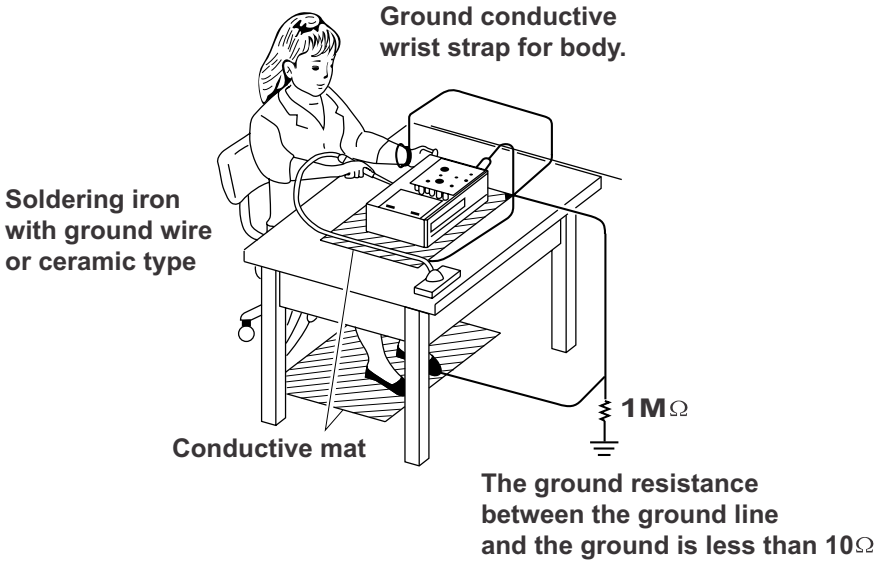
2.1 ESD PROTECTION

- レンズには絶対に触れないでください。
- DO NOT TOUCH THE LENS.
- LINSE NICHT BRÜHREN.
- NE PAS TOUCHER LA LENTILLE.

When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of laser may be received.

PREPARATION OF SERVICING

Pickup Head consists of a laser diode that is very susceptible to external static electrocity.
Although it operates properly after replacement, if it was subject to electrostatic discharge during replacement, its life might be shortened. When replacing, use a conductive mat, soldering iron with ground wire,etc. to protect the laser diode form damage by static electricity.
And also, the LSI and IC are same as above.



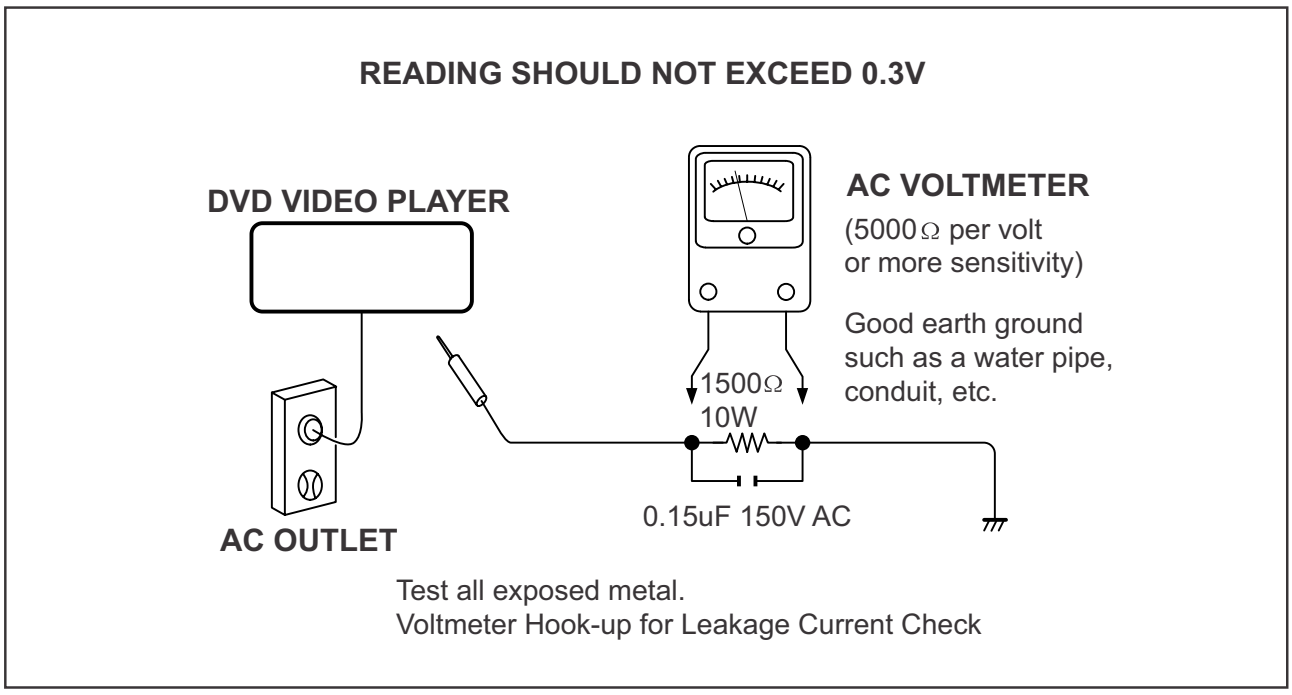
SAFTY NOTICE

SAFTY PRECAUTIONS

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000Ω per volt or more sensitivity. Connect a 1500Ω 10W resistor,paralleled by a 0.15uF 150V AC capacitor between a knomn good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500Ω resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3V.A reading exceeding 0.3V indicates that a dangerous potential exists, the fault must be located and corrected. Repeat the above test with the DVD VIDEO PLAYER power plug reversed.
NEVER RETURN A DVD VIDEO PLAYER TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.



Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

2.2 SAFETY INSTRUCTIONS

Battery Handling Guideline

Since the battery is packed in soft package, to ensure its good performance, it's very important to carefully handle the battery

2.2.1 Soft Aluminium foil

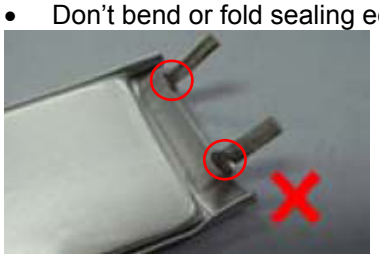
The soft aluminum packing foil is very easily damaged by sharp edge parts such as Ni-tabs, pins and needles.

- Don't strike battery with any sharp edge parts
- Trim your nail or wear glove before taking battery
- Clean worktable to make sure no any sharp particle

2.2.2 Sealed edge

Sealing edge is very flimsy

- Don't bend or fold sealing edge



2.2.3 Folding edge

The folding edge is formed in battery process and has passed all hermetic tests.

- Don't open or deform folding edge

2.2.4 Tabs

The battery tabs are not so rigid especially for aluminum tab.

- Don't bend tab

2.2.5 Mechanical shock

- Don't fall, hit, bend battery body

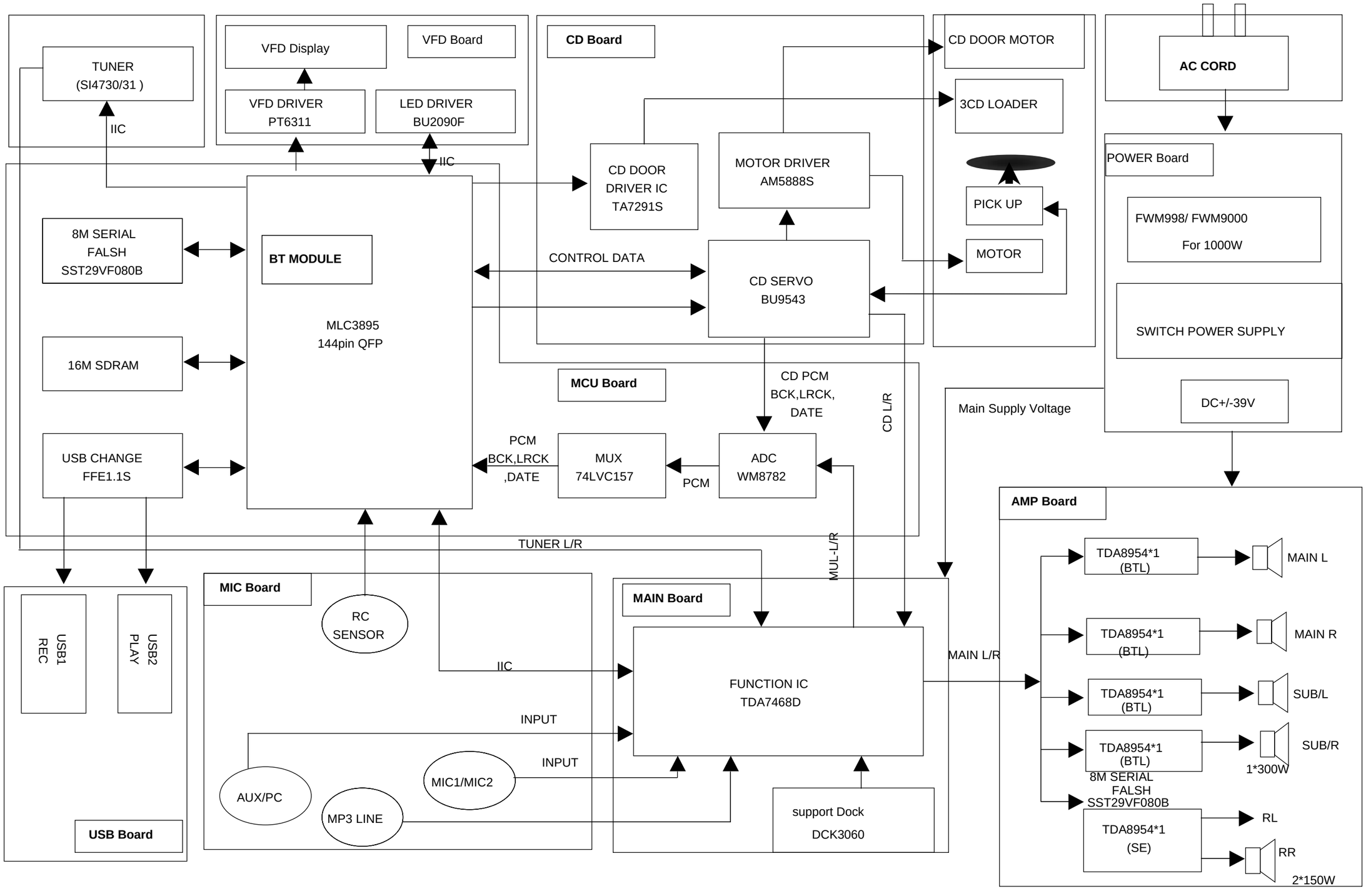
2.2.6 Short

Short terminals of battery is strictly prohibited, it may damage battery.

Caution: Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.
The battery shall not be exposed to such as sunshine, fire or similar overheated environment.
如果电池更换不当会有爆炸危险，只能用同样类型或等效类型的电池来更换.
电池不得暴露在诸如日照、火烤或类似过热环境

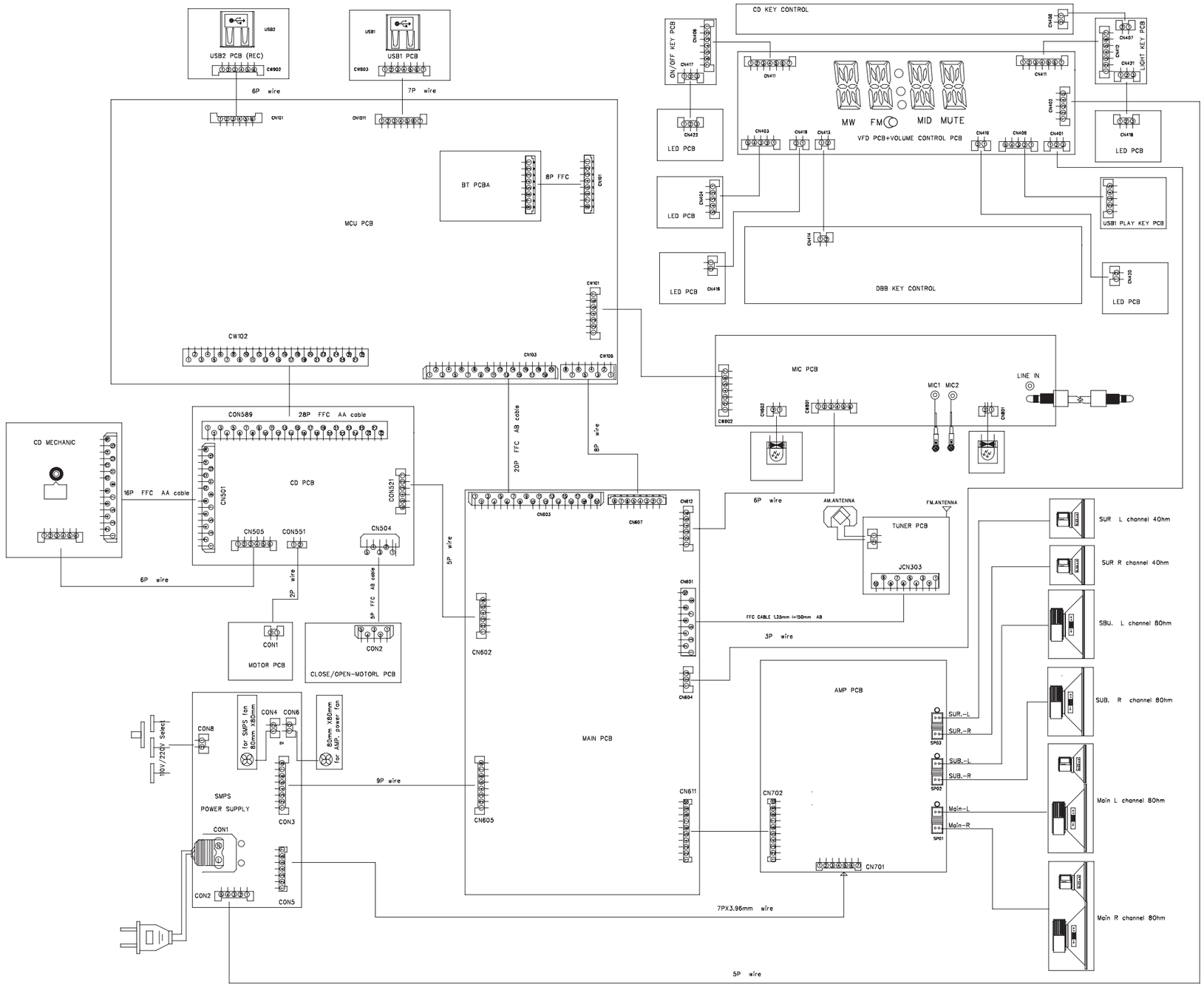
3-1

BLOCK DIAGRAM



4-1

WIRING DIAGRAM

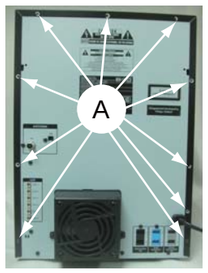


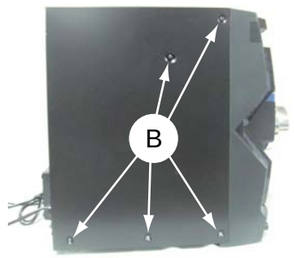
5-1

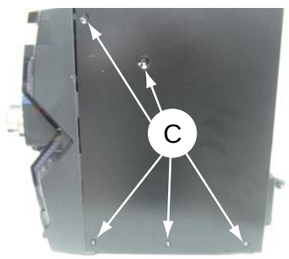
DISASSEMBLY INSTRUCTIONS

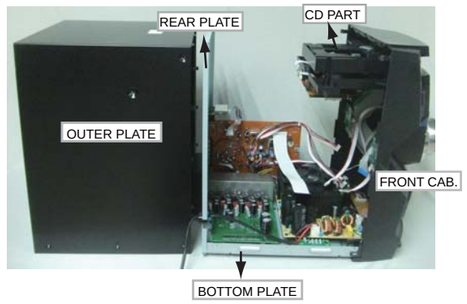
Dismantling of ***OUTER*** *Portion*

1)Remove 10 screws A and 10 screws B/C as indicated to loosen the outer plate.



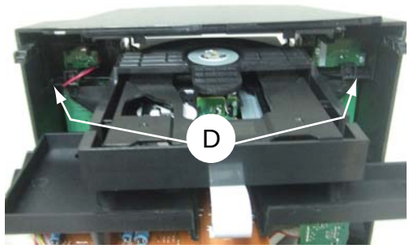


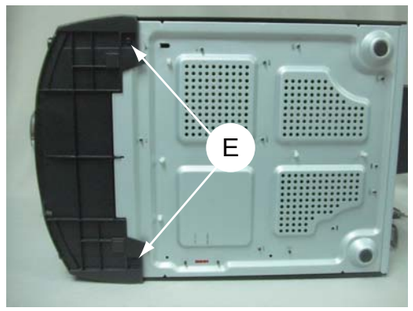


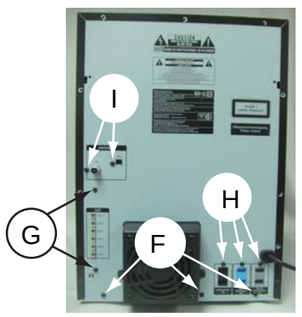


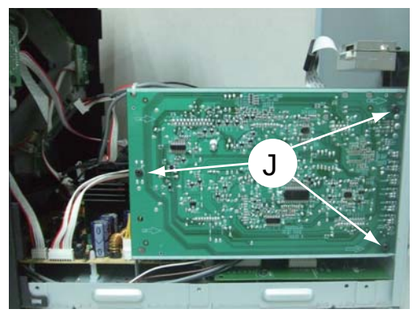
Dismantling of the CD part and Bottom plate and PCB Board

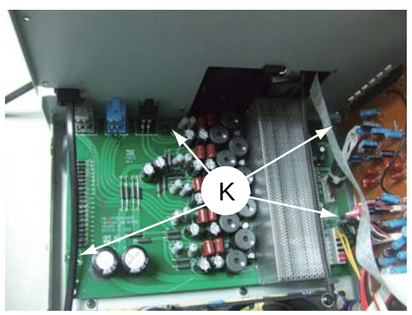
1)Remove 2 screws D as indicated to loosen the CD part.
2)Remove 2 screws E and 3 screws F as indicated to loosen the Bottom Plate.
4)Remove 2 screws G and 3 screws J as indicated to loosen the Main Board.
5)Remove 3 screws H and 4 screws K as indicated to loosen the Amp Board.
6)Remove 6 screws L as indicated to loosen the Smps power Board.
7)Remove 10 screws M as indicated to loosen the Display Board.

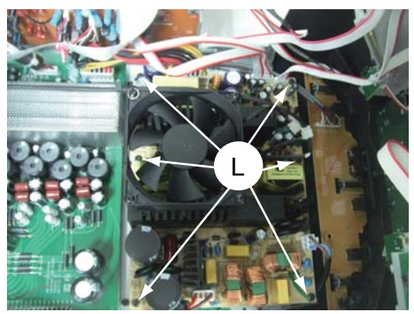


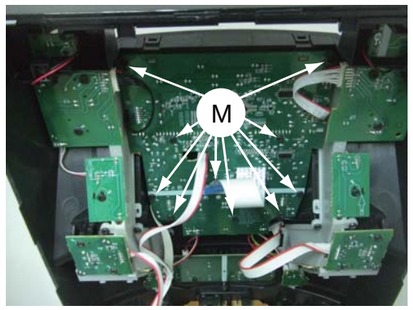






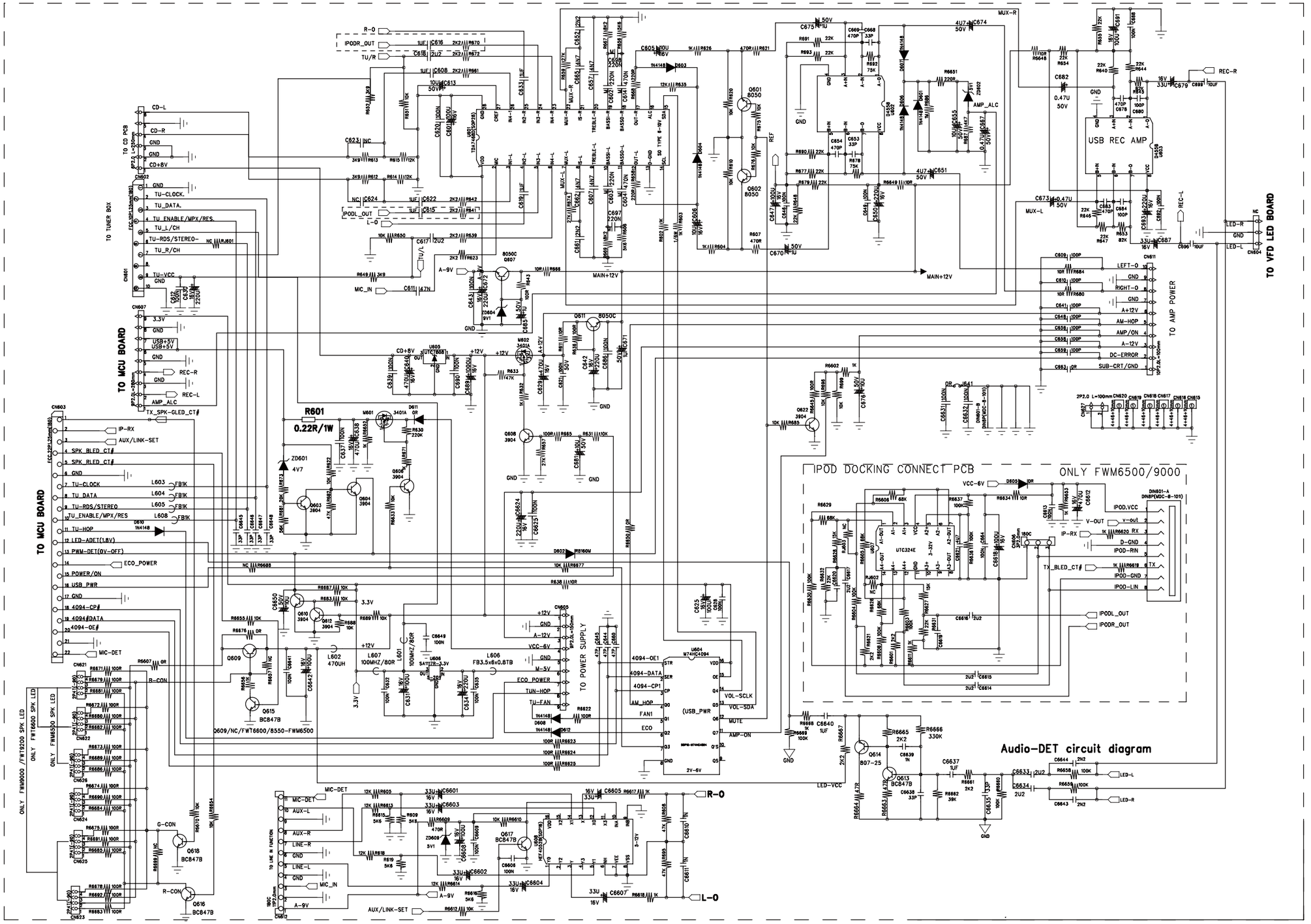




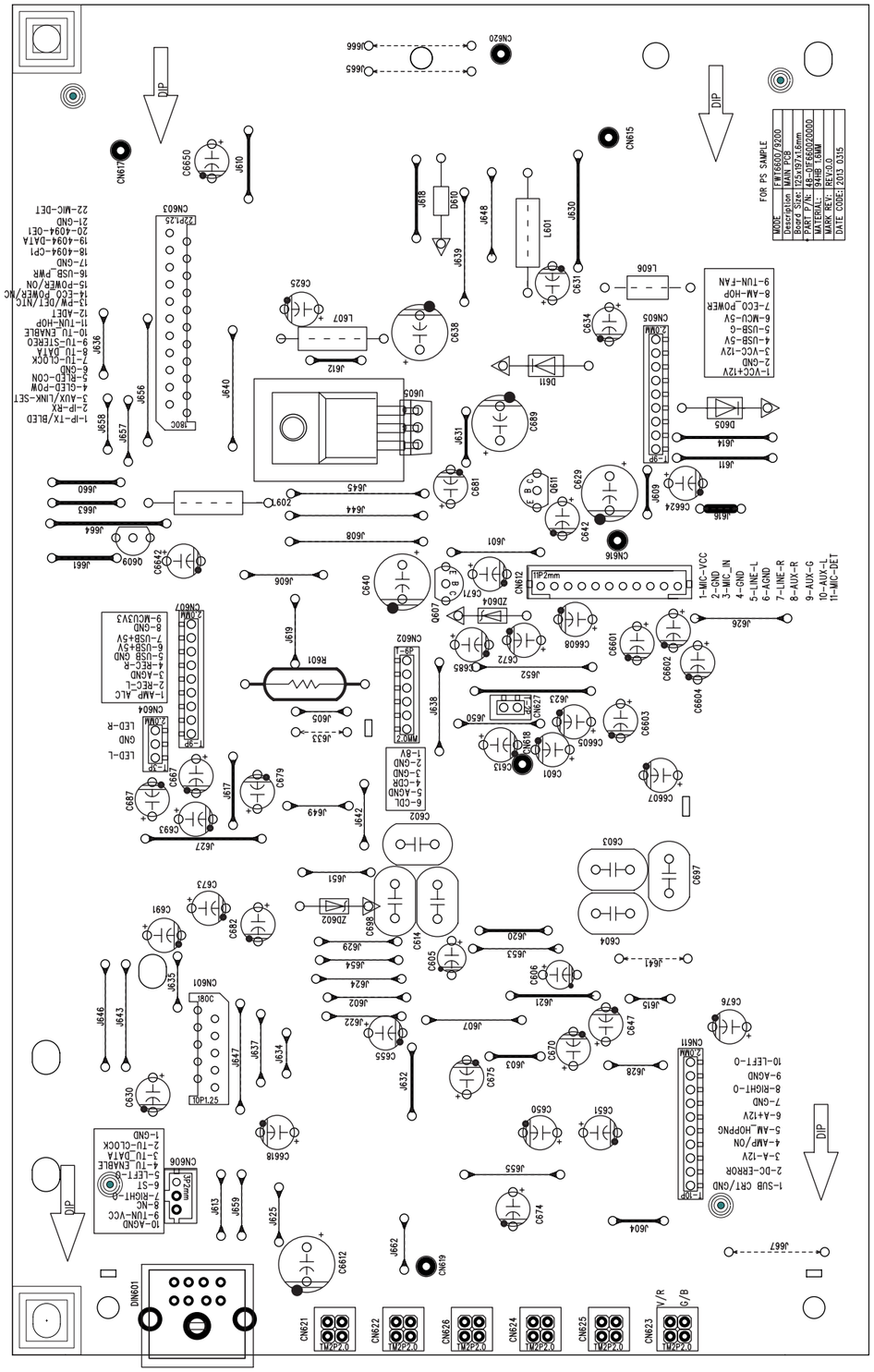


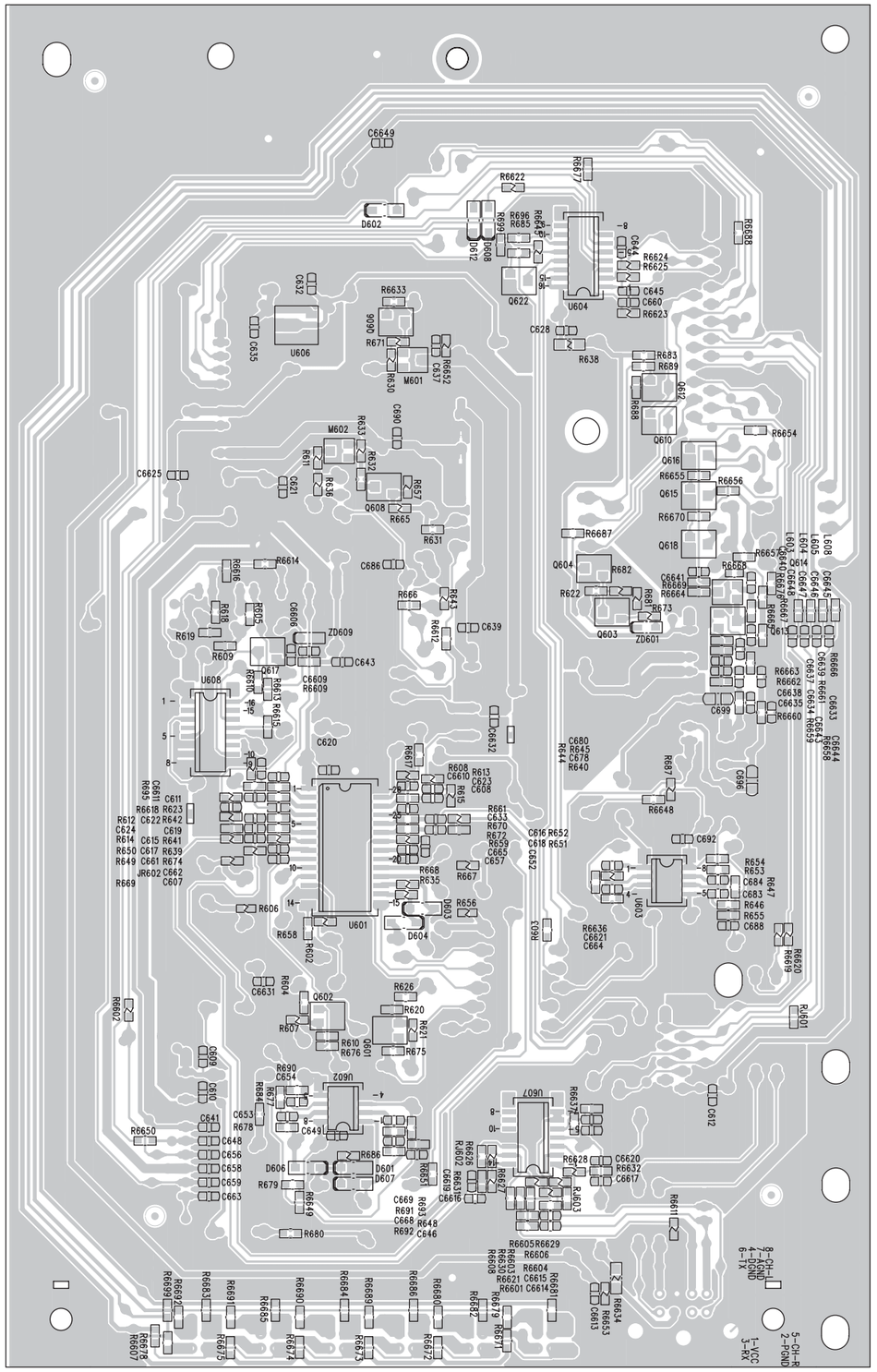
6-1

CIRCUIT DIAGRAM - MAIN BOARD



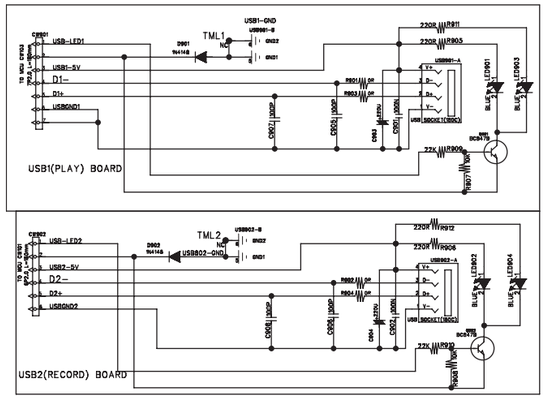
PCB LAYOUT - MAIN BOARD

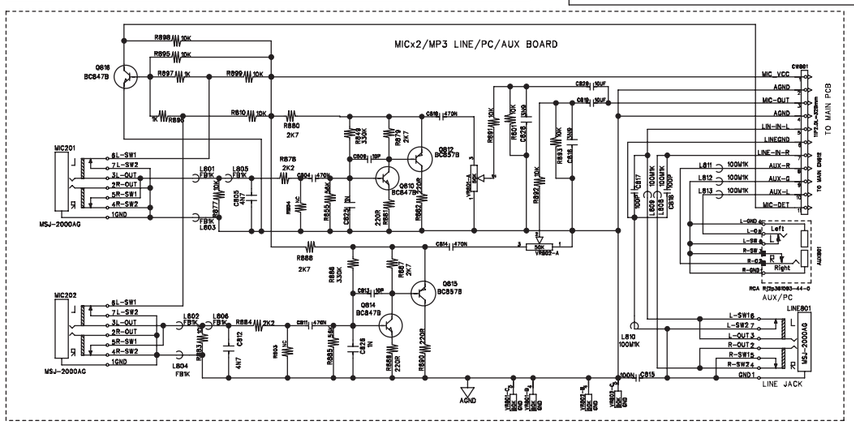


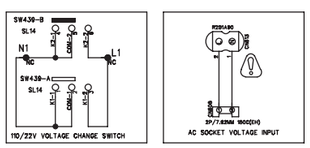


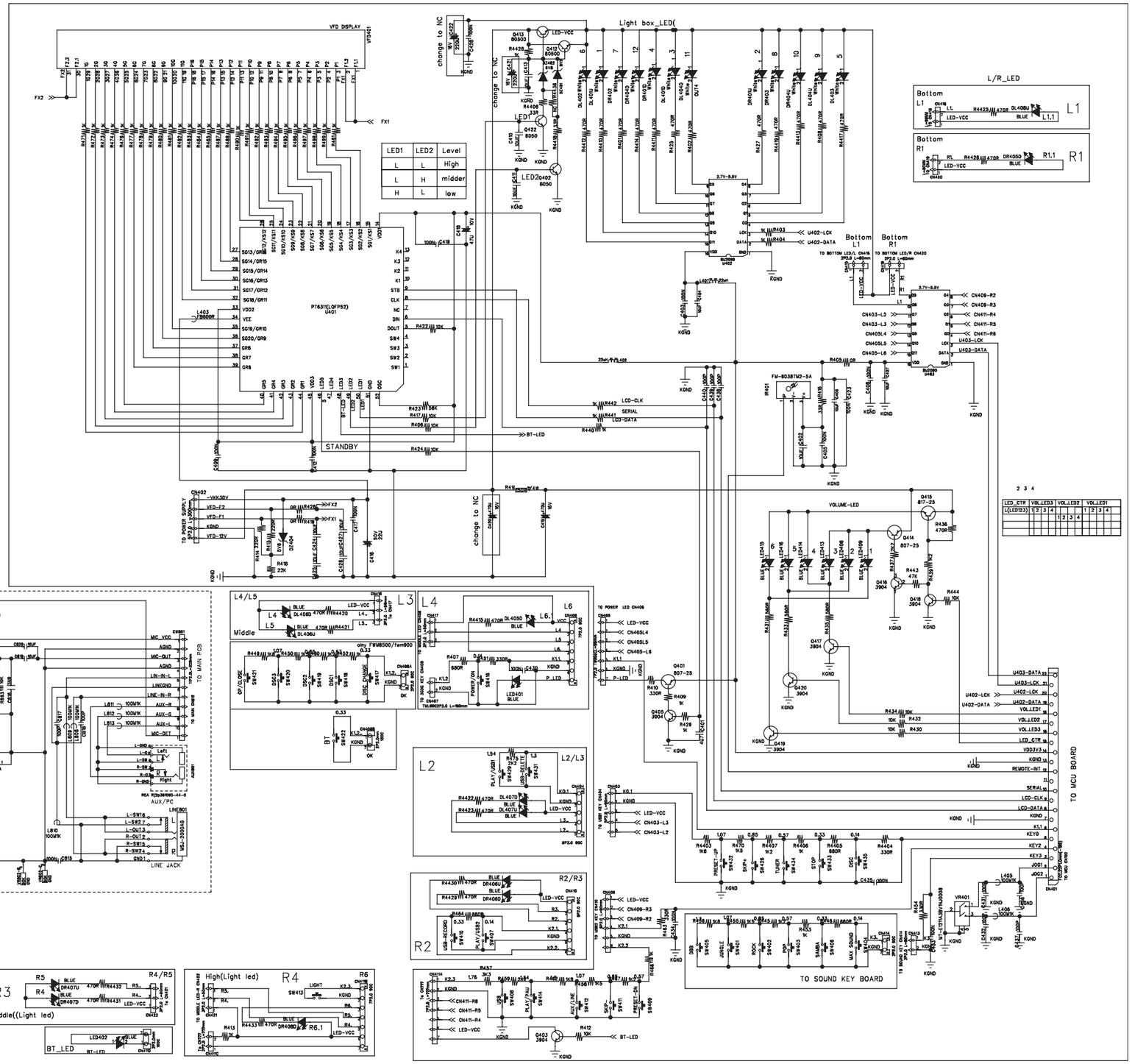
7-1

CIRCUIT DIAGRAM - DISPLAY BOARD





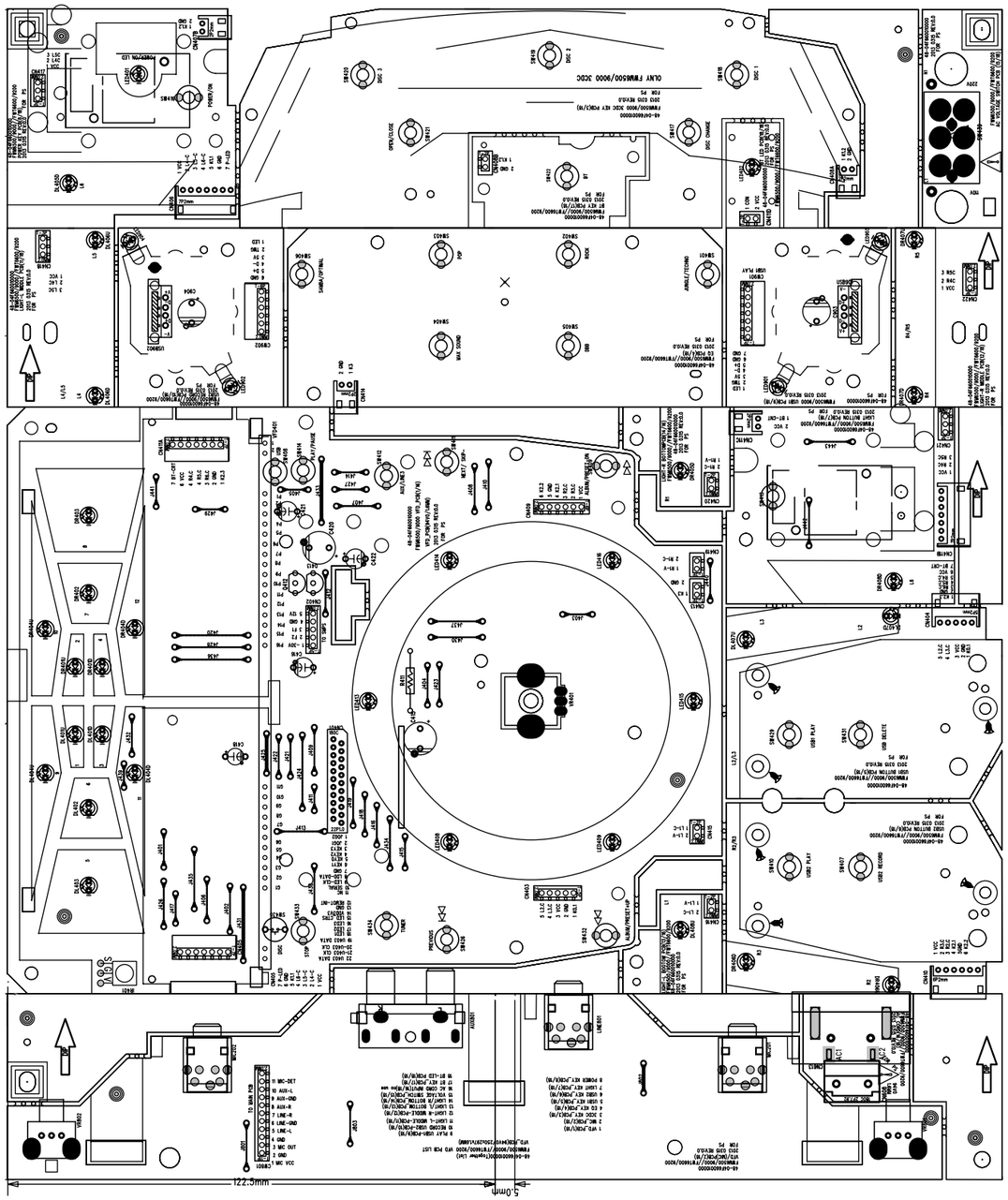


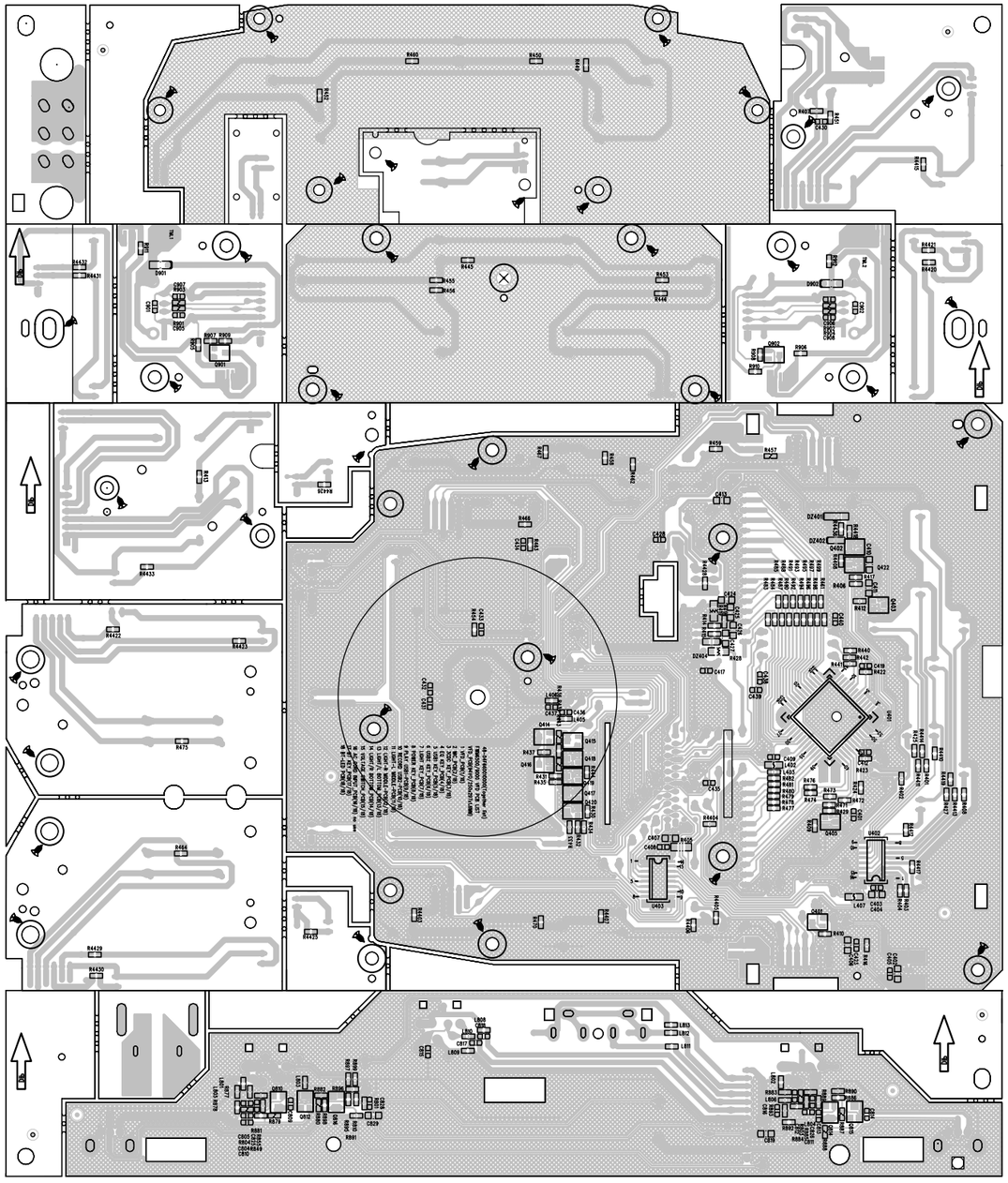


LED1	LED2	Level
L	L	High
L	H	midder
H	L	low

7-2

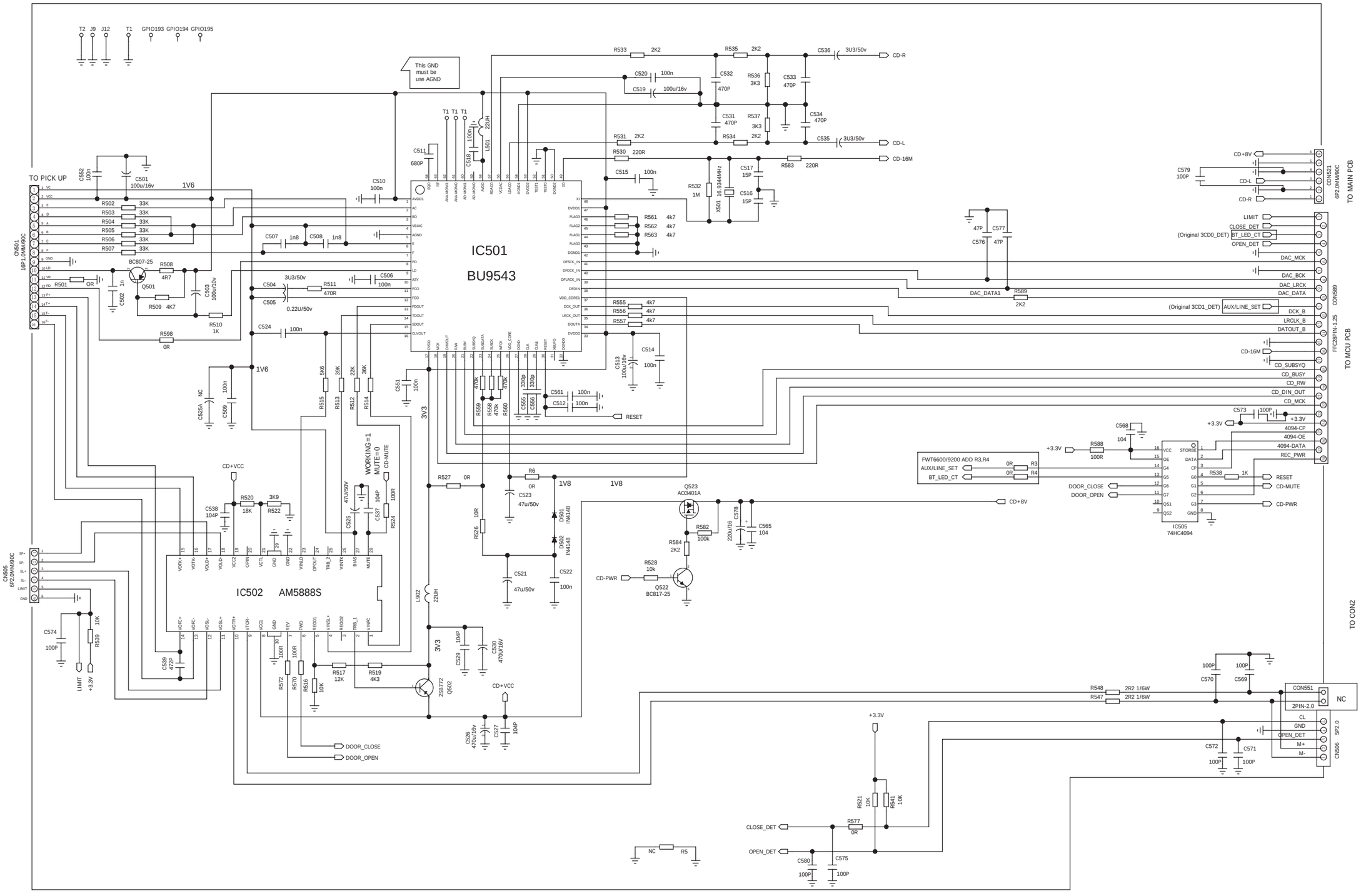
PCB LAYOUT - DISPLAY BOARD





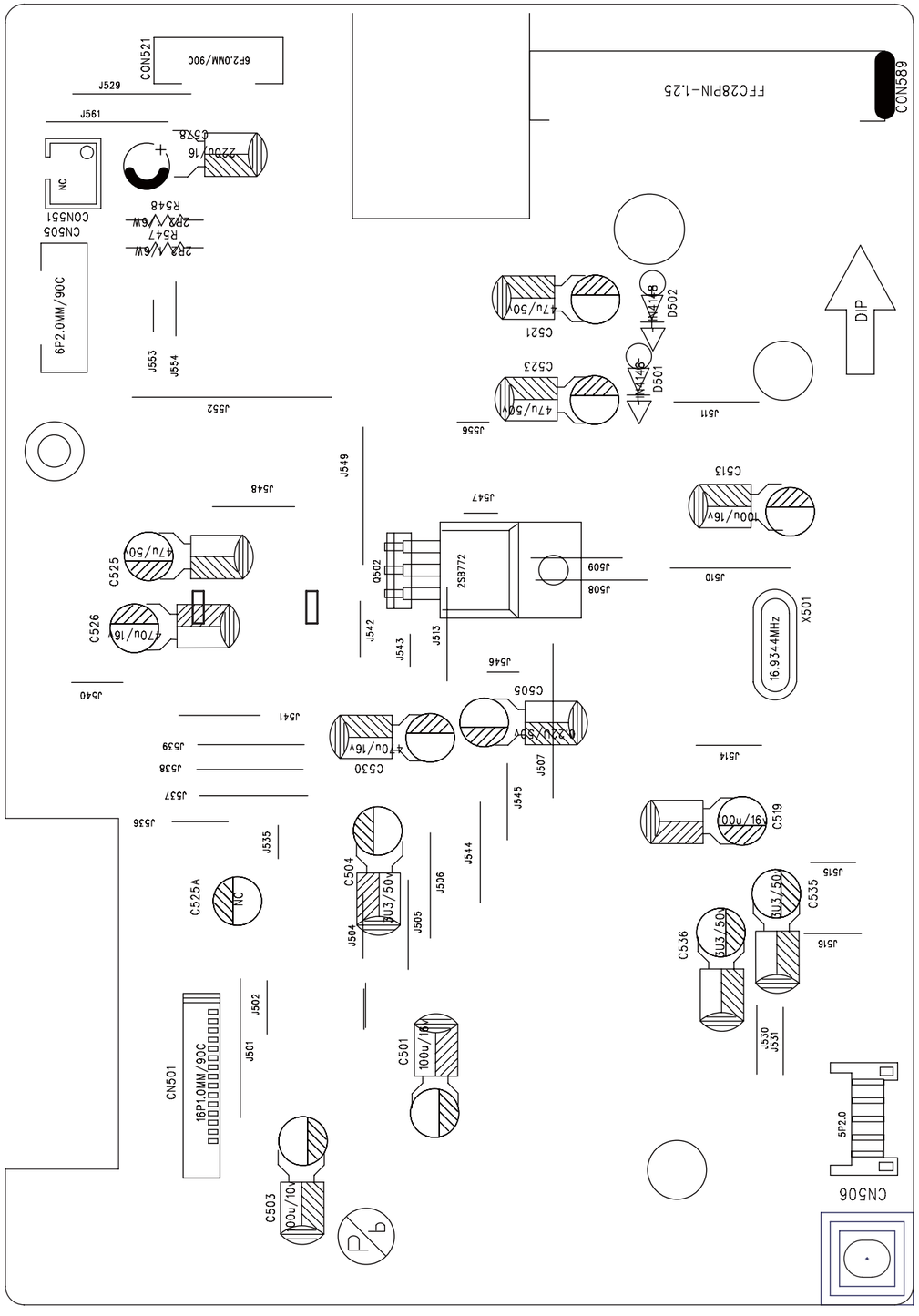
8-1

CIRCUIT DIAGRAM - CD BOARD



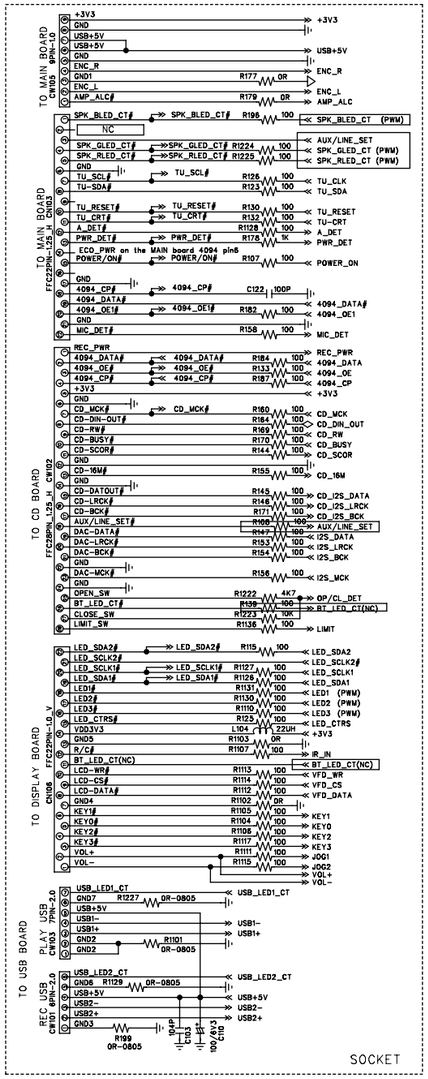
8-2

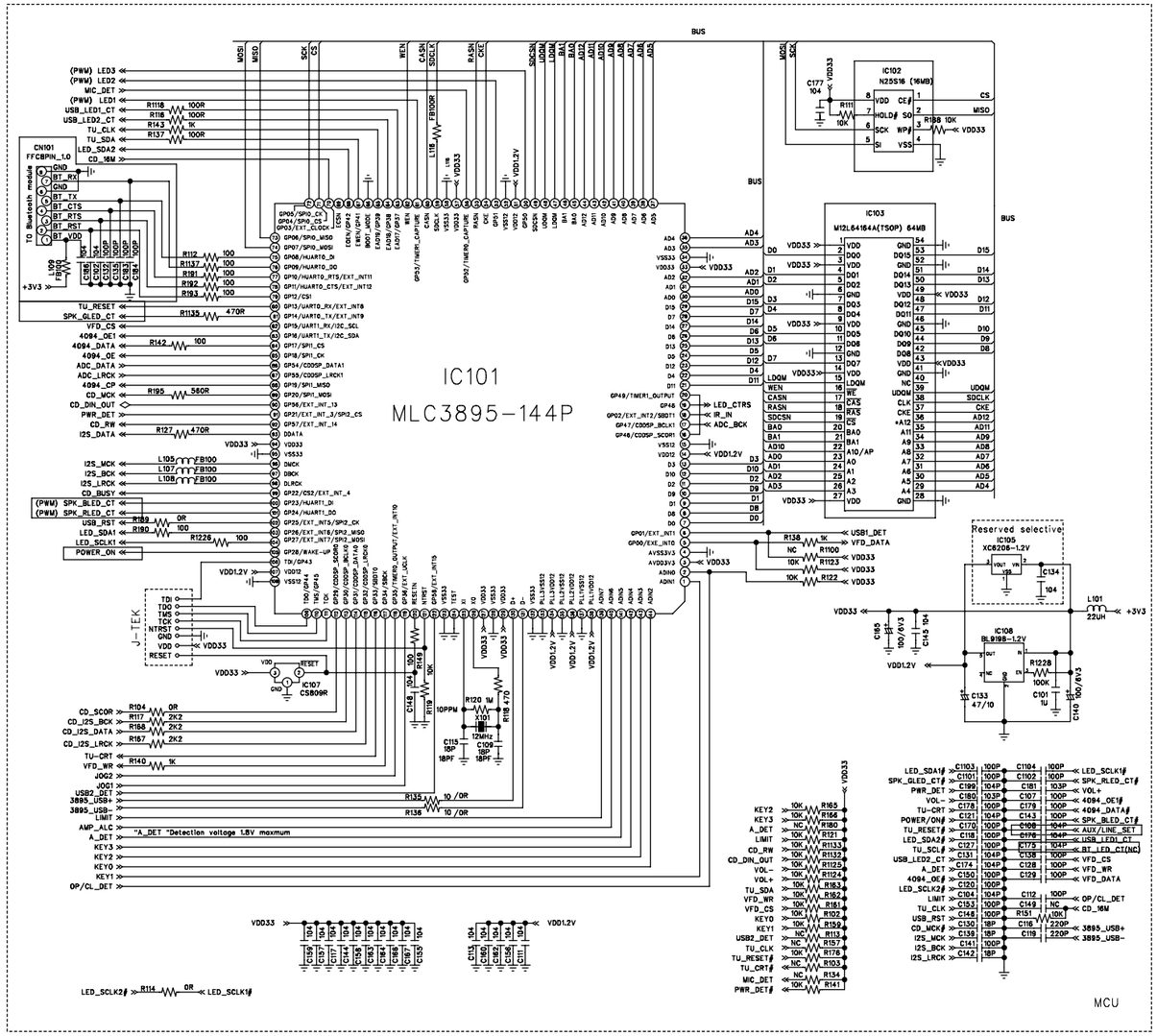
PCB LAYOUT - CD BOARD

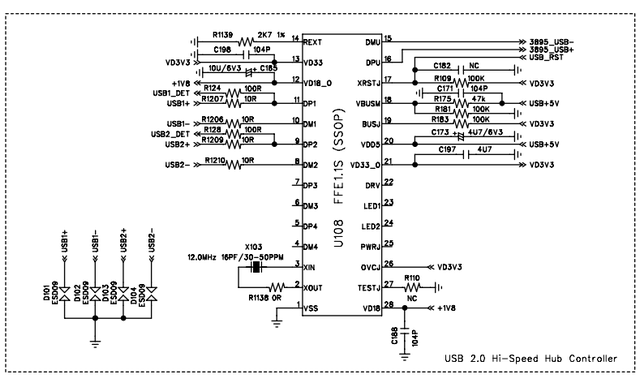


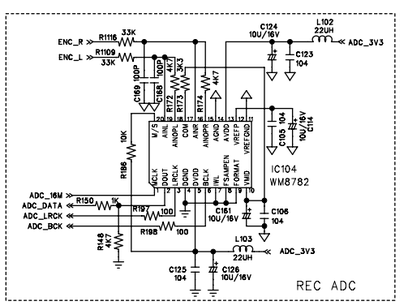
9-1

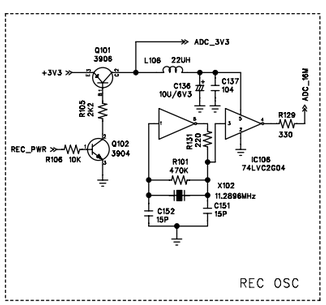
CIRCUIT DIAGRAM - MCU BOARD

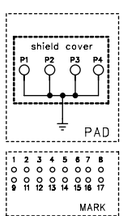






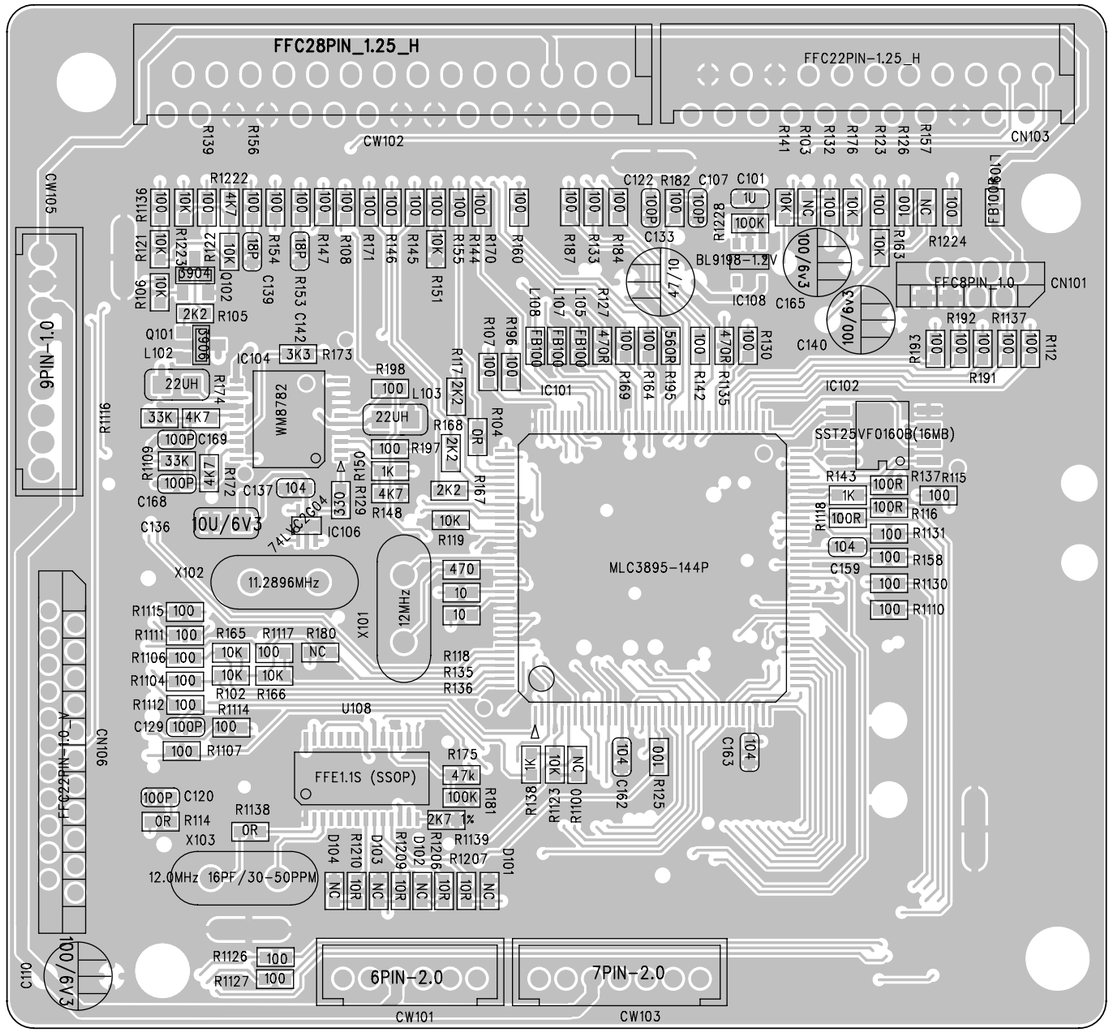


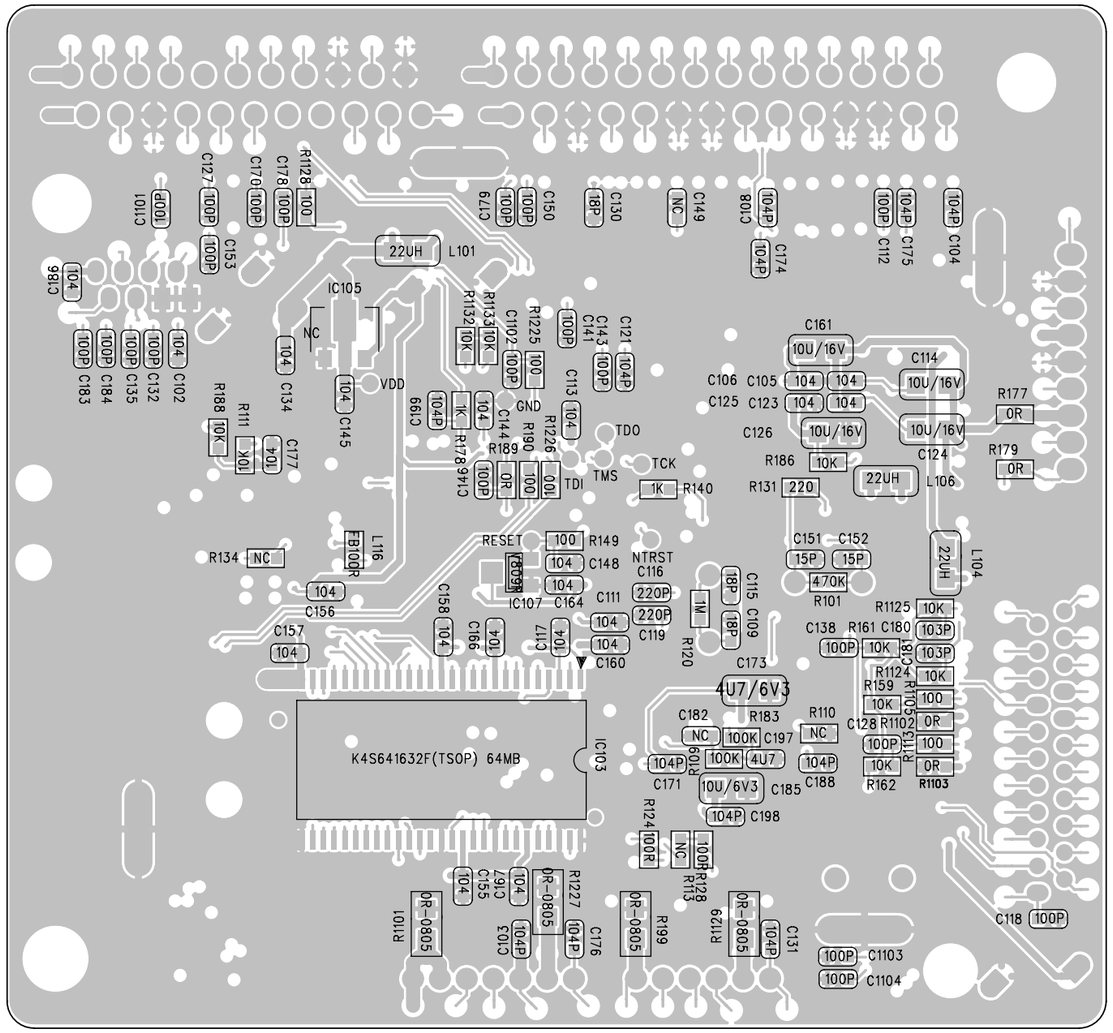




9-2

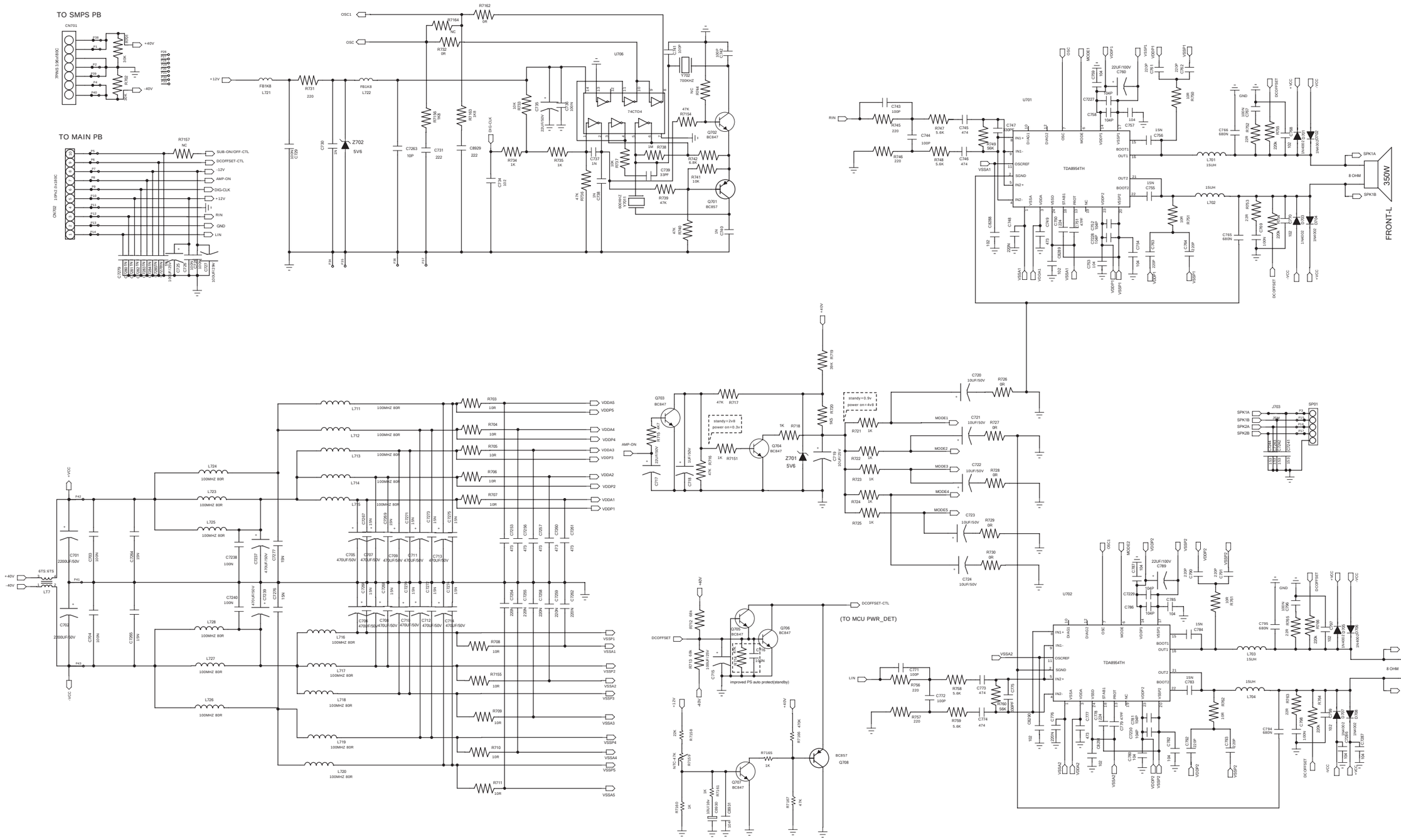
PCB LAYOUT - MCU BOARD





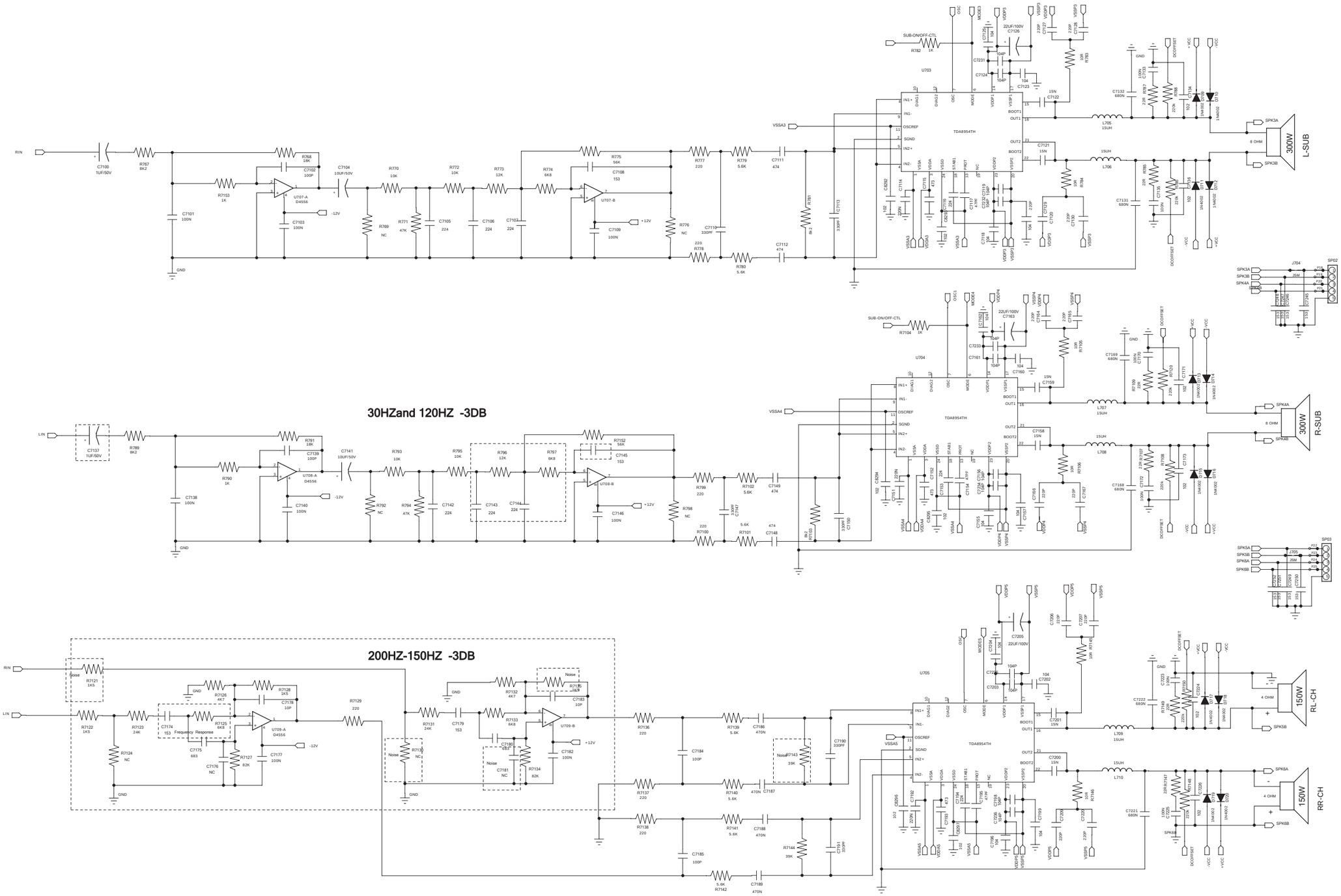
10-1

CIRCUIT DIAGRAM - AMP BOARD



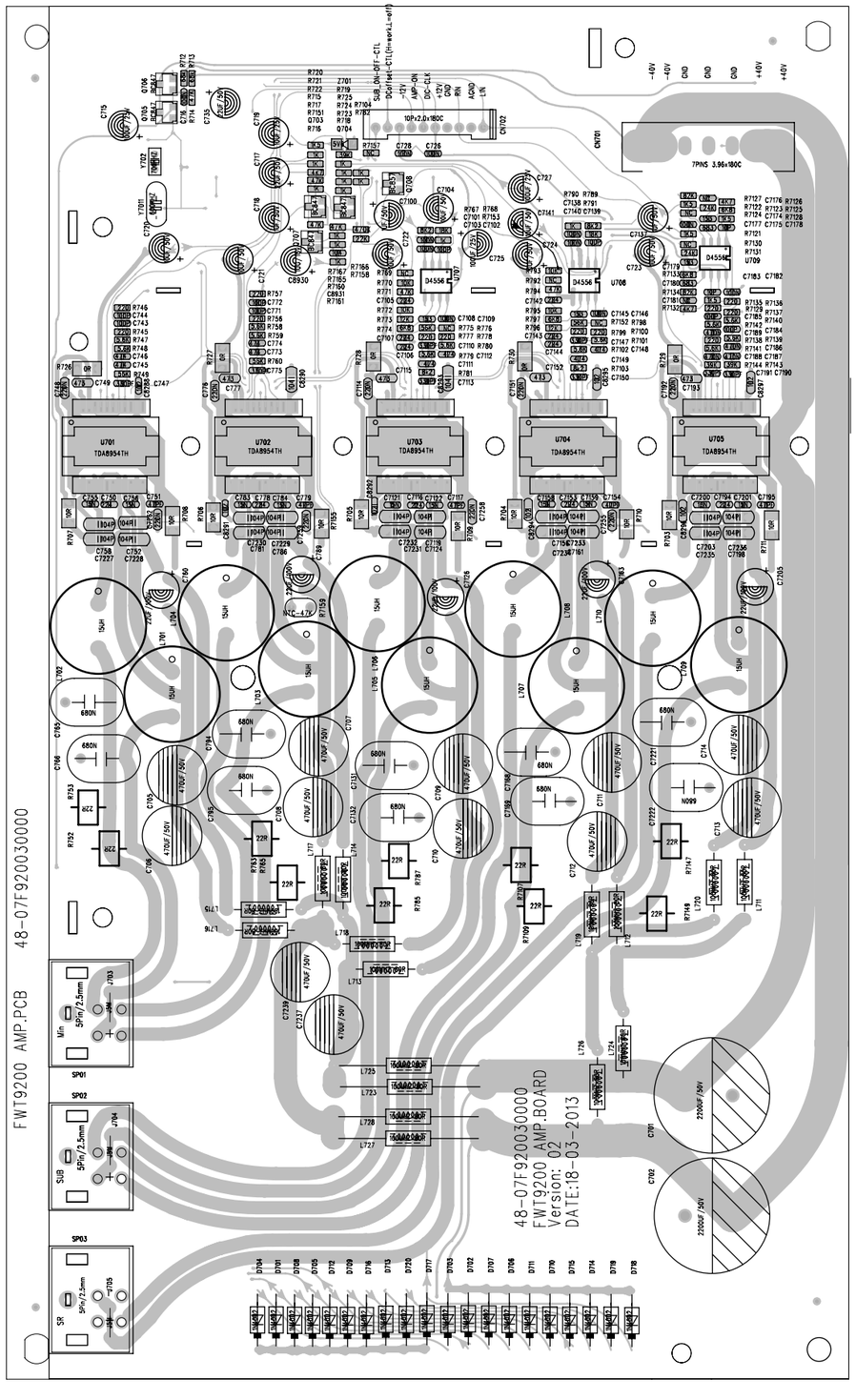
10-2

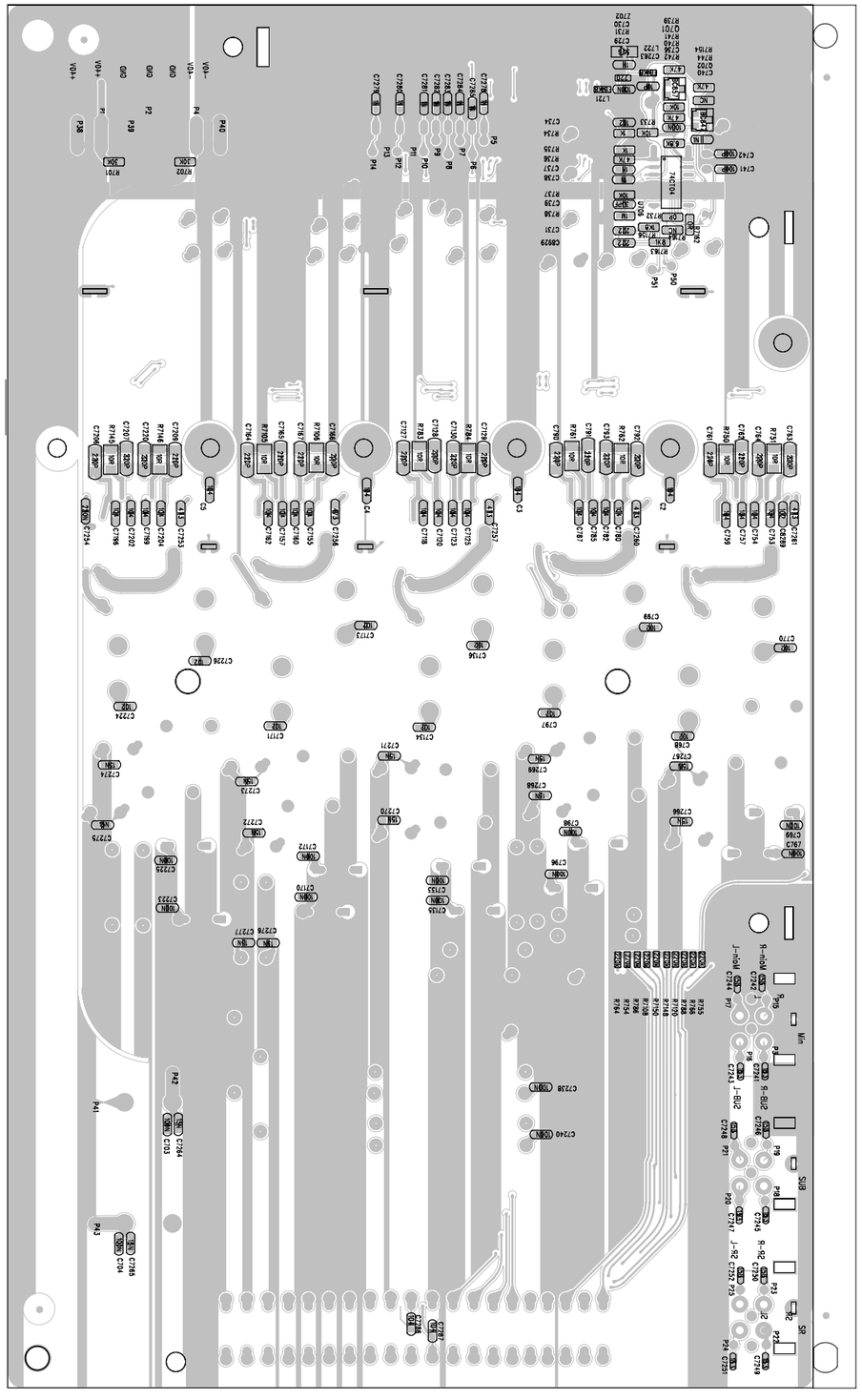
CIRCUIT DIAGRAM - AMP BOARD



10-3

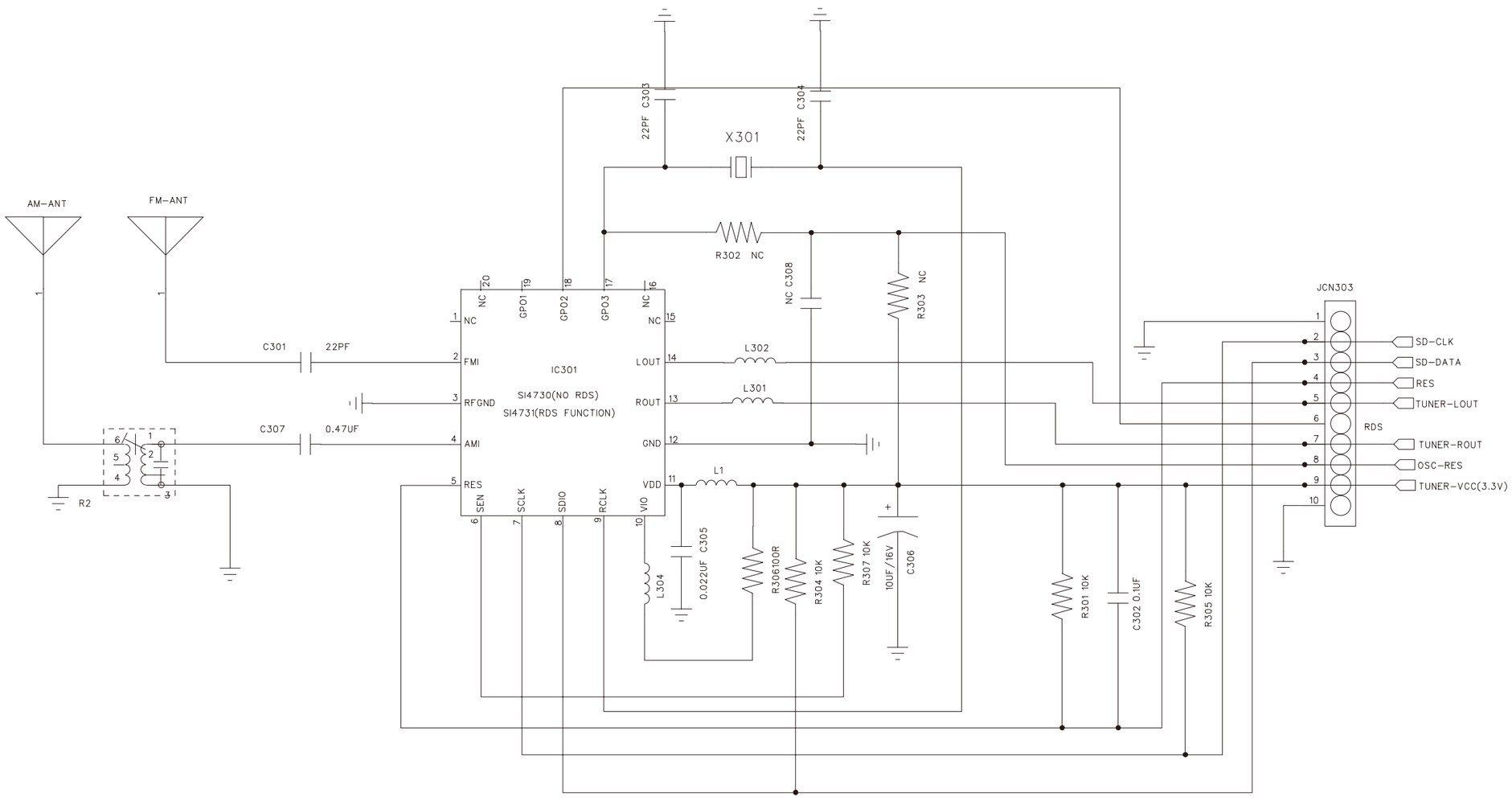
PCB LAYOUT - AMP BOARD





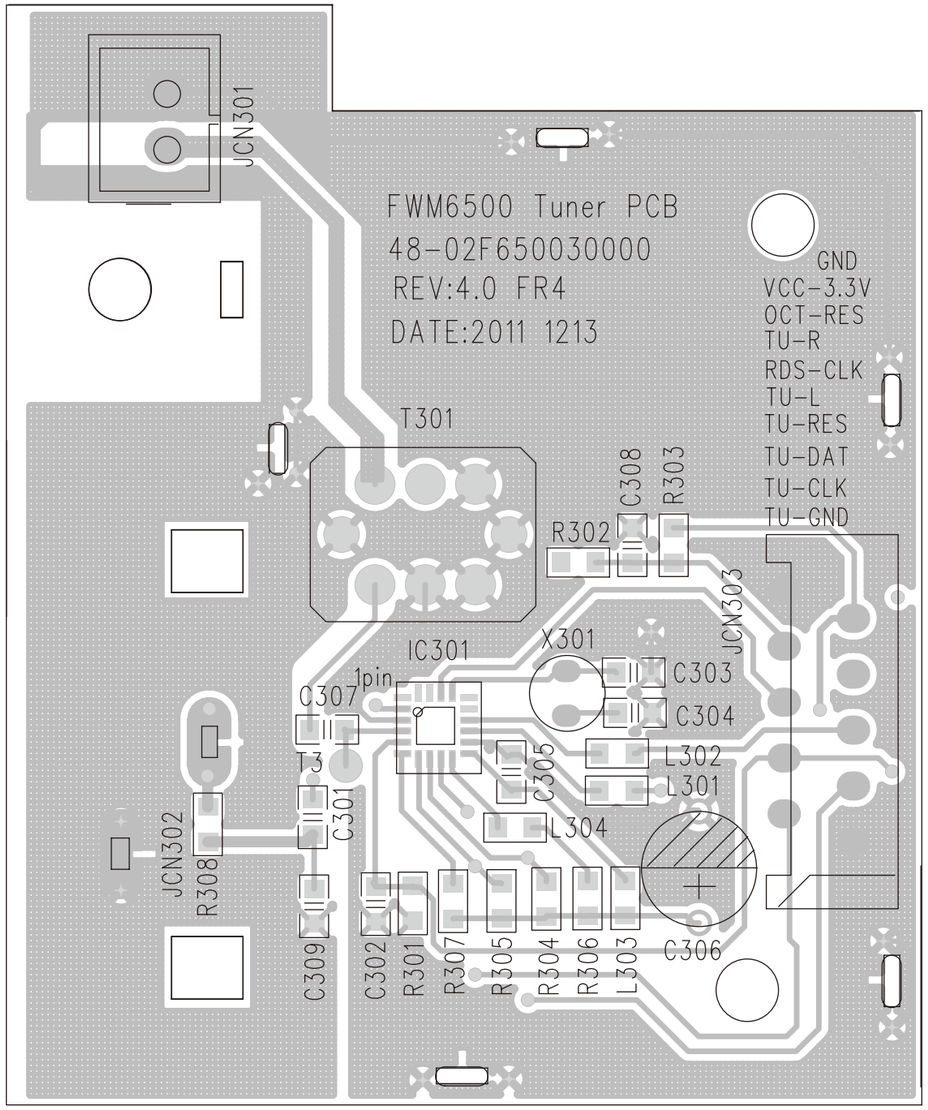
11-1

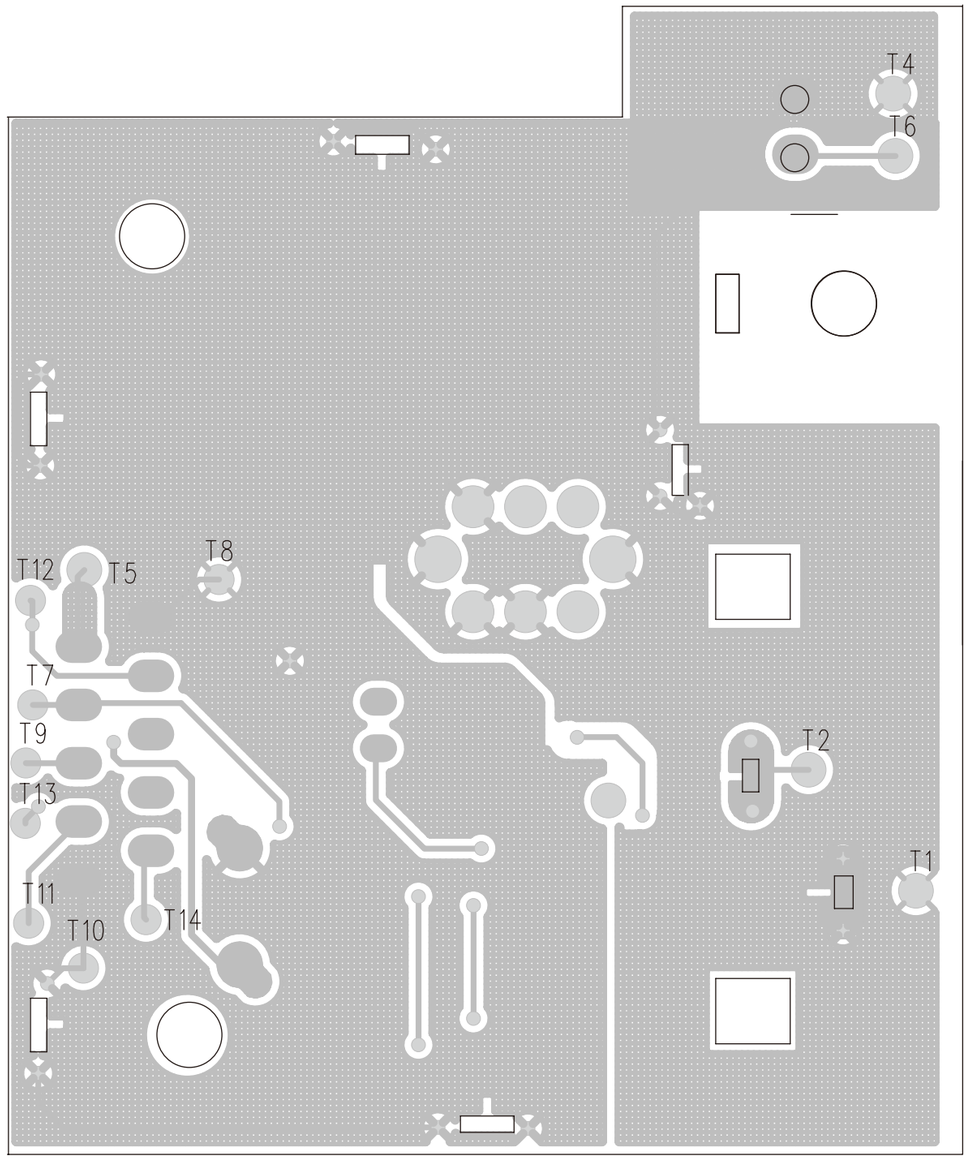
CIRCUIT DIAGRAM - TUNER BOARD



11-2

PCB LAYOUT - TUNER BOARD





12-1

EXPLODED VIEW